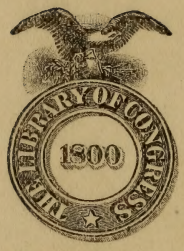
CALIFORNIA
HIGHWAYS



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CALIFORNIA HIGHWAYS

CALIFORNIA HIGHWAYS

A DESCRIPTIVE RECORD OF ROAD DEVELOPMENT BY THE STATE AND BY SUCH COUNTIES AS HAVE PAVED HIGHWAYS

By
BEN BLOW
Manager Good Roads Bureau, California State Automobile Association

San Francisco
1920

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DEDICATED

TO

THE WOMEN OF CALIFORNIA

WHO HAVE HELPED MORE

THAN

ANY OTHER AGENCY

IN

THE FIGHT FOR GOOD ROADS

FOREWORD

THE many inquiries which have come to the Good Roads Bureau of the California State Automobile Association during the past few years have served to emphasize the fact that there is a widespread and continuing demand for information as to California's state and county highways, while as a matter of fact no such publication has been extant.

The present volume has been prepared to meet that demand. It is in no sense a technical work, library shelves being full of such publications. Nor is it, even remotely, intended to be a touring guide, as road conditions change from day to day.

It is intended merely to tell what has been done in California as to the development of state and county highway systems, to picture how the present movement came into such a tremendous swing; and every attempt has been made to mention those men and women who took an active part.

The subject, naturally a dry one, has been treated in a more or less popular way. Yet the information put forth has been gathered from reliable sources and every attempt has been made to have it accurate. None the less it is entirely possible that inaccuracies have crept in, so comment and criticism are cordially invited in order that future editions may be free from any material fault.

BEN BLOW.

San Francisco, December 1, 1919.

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Paved Highway map of California	*Insert, back cover*

In the amazing Humboldt Redwoods. To be paved with concrete.

CHAPTER I

THE THREE STATE HIGHWAY BOND ISSUES

WHENEVER engineers discuss road building or automobile owners talk of touring over smooth highways the California state road system is almost invariably mentioned, for California, with its rugged topography, its thousand-mile stretch of coast line, and its hundreds of miles from east to west, has set the pace in highway construction for older and more thickly settled and far richer states.

Three State Highway bond issues, aggregating $73,000,000, have been passed by the people of California, the first, for $18,000,000, in 1910 by 12,786 votes, fourteen of California's fifty-eight counties being opposed; the second, for $15,000,000, in 1916 by a plurality of 405,132, not a single county going against the bonds; while the third, passed on July 1, 1919, was for $40,000,000, the vote being 196,084 for to 27,992 against.

Under the first bond issue a trunk line system was proposed with two main highways extending from Mexico to Oregon, one up through the great interior valleys which reach from north to south between the Coast Range mountains and the Sierra Nevadas; the other along the western slope of the Coast Range, in the main close to the ocean shore.

From one or the other of these main trunk lines, the law provided that laterals should be built to every county seat in the state, and the fact that too great a mileage was outlined, in comparison to the money provided, in all probability had something to do with the meager plurality by which the bonds went through.

That the men responsible for the building of the California

State Highway system had a troublous time is part of California's road-building history. The high finance they engaged in to stretch out their meager funds would have done credit to Wallingford and Blackie Daw, save for the fact that it was done in a worthy cause. They dickered with Boards of Supervisors and got them to provide rights of way and such bridges as were over twenty feet in span. They got the various Portland cement manufacturers to quote them a scandalous price upon cement. The rock and sand and gravel dealers listened to their tearful pleadings, wept with them and chopped their prices to the core. And even the Southern Pacific Railway, popularly regarded in those good old corporation-baiting days as an octopus, cut its freight rates on materials for the State Highway practically in half in the face of a very general opinion that all railroads were opposed to highway improvement as supplying undesirable competition.

All of these things having been accomplished, the Highway Commission perhaps thought that it was to have a period of pleasant peace. But it was not. To build roads money was needed. To get money required the sale of bonds and these bonds, by state law, must be sold for not less than par, while, as a matter of fact, par was not to be had. So trouble arose again and more frenzied finance was engaged in, the result being that those friends of the Highway Commission, the various Boards of Supervisors throughout the state, once more stepped in and paid par for bonds, supplied the necessary cash and work was thus enabled to go on.

After this, all was easy sailing, as easy as it could be when the fact that the Highway Commission was charged with building about $50,000,000 worth of roads for $18,000,000 is taken into consideration. So they went placidly to work surveying here and there, the first shovel of earth on Contract One of the concrete State Highway system being moved by Commissioner Burton Towne on August 7, 1912, in San Mateo County on the highway leading from San Francisco to the south.

That a second bond issue would be needed was a foregone

The start of actual construction work on the State Highway was made in San Mateo County on August 7, 1912. In the group are Chairman Towne of the Highway Commission with shovel; W. J. Martin, South San Francisco; L. E. Aubury, ex-State Mineralogist; Judge P. E. Lamb, Burlingame; Ex-County Recorder of San Mateo County, H. O. Heiner; Dr. J. C. McGovern; A. E. Ritchie, Fred Cunningham and Supervisor W. H. Brown, San Mateo County.

The theory of State Highway construction work is well illustrated in this picture. On one hand is the State Highway which achieves elevation by a smooth and even rise of easy grade; on the other is the old road, following perhaps some long forgotten cow path, which gains height by a short, steep climb.

conclusion as soon as the first was passed, so in 1916 the State Highway Commission put a modest request before the Legislature for another $12,000,000, whereupon the Legislature with just about the same degree of thought that one devotes to taking a little boy out and buying him an ice cream cone, tacked on $3,000,000, threw in about $10,000,000 worth of additional roads, and this bond issue, as has been set forth above, sailed through easily, somewhat to the dismay of the Highway Commission.

There is an old adage about troubles resembling quail in habit; so, shortly after the passage of the second bond issue, other troubles arose. The United States began to experience abnormal conditions, prices went up—of labor and all sorts of supplies. And then the United States plunged into war and a multitude of boards and commissions and dollar-a-year men appeared like mushrooms, earnestly and sincerely, in the main, trying to help win the war but gumming things up in relation to construction work until in practically every section of the United States highway building was halted, the work done by the California Highway Commission being the only work of magnitude which was carried on.

Just what thin ice the men in charge of State Highway construction in California skated over during the war is known to a few of us. What frenzied appeals were sent to Washington, with an occasional hurried trip to the same volcanic area, what finesse was necessary to keep road work advancing, happily turned out all right. And then Germany reached the end of the trail and blew up into forty million pieces, that being the number of its inhabitants, and the fever for highway building in California became hectic once again and resulted in the third State Highway bond issue.

It may be said that the first two State Highway bond issues were sort of cut-and-dried affairs, the program in the second one being varied slightly by the legislature, as has been told above. In the main, however, the Governor, his advisers, and the Highway Commission were the men who had the say-so, which was far from being the case in the one that was passed on July 1, 1919.

In considering this bond issue it may not be inapt to quote the closing paragraph of the "First Biennial Report" of the California Highway Commission, issued under date of December 31, 1918, which reads as follows:

"The data embodied herein may suggest still further legislation and any co-operation by the legislature of 1919 tending to the betterment of State Highway work will be appreciated by the commission."

Inasmuch as this biennial report had confessed, in thoroughly dignified and ethical language, that the State Highway Commission, owing to the general high cost of living, was "busted" and would have to shut up shop unless some more money was supplied, the paragraph quoted may be taken as a wild yell for help.

The intention of the Highway Commission was as a matter of fact, if properly encouraged, to ask for a further allotment of $10,000,000, which would serve to carry on road-building work in a modest way, but up to the last week of the first session of the legislature no friendly hand had reached out to extend them help.

The session of the California legislature, it may not be inapt to state, consists of three distinct periods, the first being the period when organization is had, resolutions are passed, and bills introduced. The second period is the recess, wherein legislators are supposed to quietly ruminate over the laws proposed. The third period is that unhappy time when the many are called and the few are chosen, when proposed legislation is called up, debated upon, and sometimes passed, a provision being embodied in the law that each legislator shall have the privilege of introducing two bills in the last session if he cares so to do.

This slight digression is excusable, perhaps, to emphasize the fact that while the Highway Commission, like Barkis, was willin', no bill to provide more funds had up to Thursday, January 23d, the next to last day of the first session of the 1919 California legislature, been introduced.

On that day, however, in the Highways Committee room of the Senate a meeting was held to discuss the formation of a road district for the purpose of securing the development

of the "Skyline Boulevard," south from San Francisco through the counties of San Francisco, San Mateo, Santa Clara, and Santa Cruz.

The man presiding at this meeting was M. B. Johnson of Montara, representing San Mateo, San Benito, and Santa Cruz counties in the State Senate, and those present were J. A. Harvey, chairman, and George H. Rostron, of the Santa Cruz County Board of Supervisors; Richard J. Welch, E. J. Brandon, and Joseph Lahaney, of the San Francisco County Board of Supervisors with H. A. Mason acting in an advisory capacity; George G. Radcliff of Watsonville, Santa Cruz County; Austin B. Fletcher, highway engineer, with N. D. Darlington, chairman, Emmett Phillips, and C. C. Carlton, attorney, of the California Highway Commission; Burton A. Towne of Lodi and Ben Blow of San Francisco, together representing the California State Automobile Association.

When the business dealing with the Skyline Boulevard had reached conclusion the troubles of the State Highway Commission became the subject of informal discussion, much sympathy being offered these gentlemen, and finally a motion was put "that this gathering resolve itself into a committee of citizens of the state of California to take up the matter of another State Highway bond issue, and that Mr. Johnson be requested forthwith to confer with Governor Stephens and ask him if he would give audience with this committee."

This motion was promptly seconded, and after a brief interval those present were advised that the Governor would be pleased to entertain them briefly, which happiness was shortly afforded him, the question being asked if he was in favor of another State Highway bond issue.

The Governor was. He made a nice little speech in saying so. He said that he believed in good roads—was proud of the work the California Highway Commission had done—thought that more roads were needed—and that he was back of the plan lock, stock, barrel, gunpowder, shot, and wadding, or words to that effect.

Whereupon the committee repaired once more to the committee room and upon motion a committee of six was selected: M. B. Johnson of Montara, chairman; Adolph Mack of San Francisco, representing the San Francisco Chamber of Commerce; Ralph Hamlin of Los Angeles, representing the Los Angeles Chamber of Commerce; Jonathan Dodge of Los Angeles, chairman of the Board of Supervisors and representing the State Association of Boards of Supervisors; Henry Keller of Los Angeles, representing the Good Roads Committee of the Automobile Club of Southern California; and Burton A. Towne of Lodi, representing the Good Roads Bureau of the California State Automobile Association, who was named as secretary.

It was further moved and seconded that this committee be directed to meet at once in San Francisco for the purpose of issuing a state-wide call to boards of supervisors, chambers of commerce, woman's clubs, farm bureaus, and various other organizations to gather and discuss the matter of another State Highway bond issue and fix the amount therefor.

In other words, the plan was to program the matter, vastly good politics when a program can be put across, and various meetings were held at the office of the California State Automobile Association, in San Francisco, by the committee of six with numerous volunteer advisers, and invitations to attend a good roads mass meeting were sent broadcast throughout the state.

As the result of these invitations, on February 12, in the rooms of the Board of Supervisors in the San Francisco City Hall, an aggregation of road boosters gathered, forty-nine of the fifty-eight counties of the state being represented—when, with a few well-chosen remarks, Mayor James Rolph, Jr., told them how glad he was to see them and how much the state of California needed more highways.

Whereupon arose a stout-hearted (and it may be said a stout-fisted) Supervisor from a nearby county and on behalf of his brethren from the country said that undoubtedly all present were in favor of good roads but that they objected

The State Highway in San Diego County runs for miles almost at the surf line.

State Highway in Fresno County. This is one of California's best known road pictures.

State Highway in Santa Clara County.

strenuously to being called together to be programmed by a few paid employees of automobile associations, which he had heard was to be attempted, glowering meanwhile at the particular representative of the automobile association he had in mind.

"Very well, then," said the chairman, Mr. Johnson, the tapping of his gavel sounding like the efforts of a half-grown woodpecker on a far-off stump, "no program goes if you don't want it, but I believe that everybody present does want to see the State Highway finished. To do that, we are told, will take $20,000,000. I'll entertain a motion that it is the sense of this convention that a new State Highway bond issue should be provided for by the legislature, to include the sum of $20,000,000 for finishing up the system already proposed and to include such further sum as this convention shall decide upon for the inclusion of other roads."

No sooner said than done. This motion carried enthusiastically, whereupon it was moved and seconded that a committee of twenty-one be appointed by the chair to act in conjunction with the officers already selected in deciding upon what roads should finally have approval and in what amount the proposed bond issue should be.

The officers presiding over the convention were M. B. Johnson, chairman; Burton A. Towne, secretary; and forthwith Mr. Johnson named the following committee of twenty-one: Henry Barker, Northern California Hotel Men's Association; Michael Casey, International Teamsters Association; F. A. Cook, Southern California Hotel Men's Association; Jonathan S. Dodge, State Association of Boards of Supervisors; T. F. Flaherty, Board of Supervisors of Riverside County; Edward Fletcher, San Diego Chamber of Commerce; Ralph Hamlin, Los Angeles Chamber of Commerce; J. A. Harvey, Santa Cruz County Board of Supervisors; Henry Keller, Automobile Club of Southern California; Adolph Mack, San Francisco Chamber of Commerce; Thomas Maxwell, Napa County Board of Supervisors; John MacBain, San Mateo County Board of Supervisors; Thomas McCormack, Solano County

Board of Supervisors; Margaret McGovern, New Era League; B. B. Meek, Oroville Chamber of Commerce; John S. Mitchell, California Development Board; Daniel Murphy, State Federation of Labor; J. K. O'Brien, Tahoe-to-Ukiah Association; R. L. Riley, San Bernardino County Board of Supervisors; Fred Shaffer, Yolo Board of Trade; Richard J. Welch, San Francisco Board of Supervisors.

This done, the committee settled down to consideration of the various roads presented and for three days and part of some nights it deliberated, while fights were going on all over the lot; the final determination being arrived at that approximately $40,000,000 was the proper sum and that pretty nearly any road that anybody wanted ought to go in. Whereupon it adjourned, like a cat waiting at a mousehole, and glued its collective eye upon the Legislature to see that it did not kick over the traces or perform any other untoward act.

The Legislature, awed perhaps by the size and sincerity of the convention held in San Francisco, having confidence perhaps in the Senator from San Mateo, who had the matter in charge, performed as per schedule. A joint conference was had by the Senate Roads and Highways Committee (made up of M. B. Johnson, Montara; Frank H. Benson, San Jose; W. E. Duncan, Jr., Oroville; S. C. Evans, Riverside; Egbert J. Gates, South Pasadena; Dwight H. Hart, Los Angeles; J. L. C. Irwin, Hanford; Lyman M. King, Redlands; Claude F. Purkitt, Willows; E. S. Rigdon, Cambria; B. F. Rush, Suisun; E. P. Sample, San Diego; W. B. Shearer, Yreka; Herbert W. Slater, Santa Rosa; J. R. Thompson, Santa Barbara) and the Assembly Roads and Highways Committee (consisting of Wm. J. Martin, chairman, Salinas; Crombie Allen, Ontario; J. Stanley Brown, El Centro; W. E. Callahan, Antioch; F. J. Cummings, Ferndale; W. A. Doran, San Marcos; Walter Eden, Santa Ana; F. L. Eksward, Burlingame; A. P. Fleming, Los Angeles; W. C. Oakley, Santa Maria; Ivan H. Parker, Auburn; Harry Polsley, Red Bluff; A. F. Sterns, Healdsburg; C. P. Vicini, Jackson; Guy Windrem, Madera), the definite sum of $40,-

000,000 was fixed upon, everybody's road, and a few others, put in, and the bill sailed through like fire in a hayfield.

Other troubles arose, however. The State Highway Commission, overcoming its great native modesty, called attention to the fact that it was at present financially embarrassed and that unless some extraordinary legislation was developed it would be teetotally "busted" before funds could be derived from the proposed bond issue, which, under existing laws, could not be voted upon before the fall of 1920 at the general election, a lapse of time which might just as well be a century so far as present pecuniary needs were concerned.

And then arose a Moses with his rod and smote the rock and funds poured forth. Attorney General Webb was the man who finally evolved the plan of amending the constitution of California to provide a further sum of $40,000,000 for State Highway construction by the sale of bonds, the one election serving the double purpose of amending the constitution of the state of California and providing $40,000,000 for more roads.

Immediately upon the setting of July 1 as the date for the election, the California Good Roads Campaign Committee was formed, with L. A. Nares of Fresno as chairman, the vice-chairmen being Francis Carr of Redding and Henry W. Keller of Los Angeles, while joint secretaries were named as follows: D. E. Watkins, manager California State Automobile Association, San Francisco; John F. Shea, secretary Northern California Hotel Men's Association; E. W. Casson, secretary Southern California Hotel Men's Association; and Standish L. Mitchell, secretary Automobile Club of Southern California.

The general committeemen were as follows: C. J. Luttrell, Yreka; James K. O'Brien, Smartsville; Jules Alexander, Susanville; Frank Freeman, Willows; H. F. Ferrill, Eureka; Senator Herbert Slater, Santa Rosa; C. G. Leeson, Oroville; H. E. Welch, Lodi; Supervisor R. J. Welch, San Francisco; Daniel J. Murphy, San Francisco; Joseph E. Caine, Oakland; John L. D. Roberts, Seaside; E. L. Sherman, Modesto; Charles D. Blaney, Saratoga; Fred L. Baker, Los

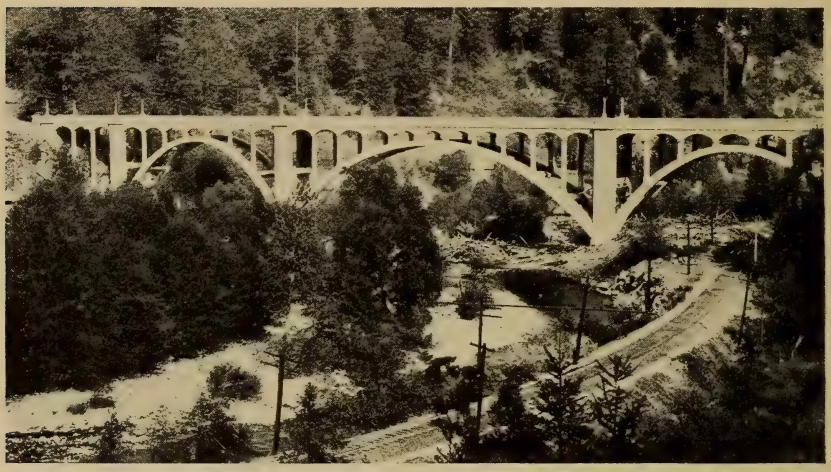
Angeles County; Frank J. Belcher, Jr., San Diego County; F. B. Fuller, Imperial County; W. L. Benchley, Orange County; John H. Fisher, San Bernardino County; Frank A. Miller, Riverside County; C. A. Barlow, Kern County; C. D. Hubbard, Santa Barbara County; Ben Maddox, Tulare County; Charles Donlin, Ventura County; Dr. W. M. Stover, San Luis Obispo County; H. J. Nichols, Pomona.

The county chairmen were: Mayor John L. Davie, Oakland, Alameda County; James F. Parks, Plymouth, Amador County; W. B. Dean, Chico, Butte County; Clarence Getchell, San Andreas, Calaveras County; J. B. De Jarnatt, Colusa, Colusa County; Dr. C. H. Henderson, Martinez, Contra Costa County; W. P. Malone, Crescent City, Del Norte County; J. W. Shanklin, Placerville, El Dorado County; George Waterman, Fresno, Fresno County; Frank Leavitt, Willows, Glenn County; Jerry Millay, Eureka, Humboldt County; C. C. Spinks, Hanford, Kings County; C. C. McMahan, Bartlett Springs, Lake County; L. R. Cady, Susanville, Lassen County; H. B. Connert, Mariposa, Mariposa County; W. S. Orvis, Madera, Madera County; Caspar J. Gardner, Mill Valley, Marin County; Keith C. Eversole, Ukiah, Mendocino County; John R. Graham, Merced, Merced County; J. W. Cummings, Alturas, Modoc County; J. L. D. Roberts, Seaside, Monterey County; Supervisor Thomas Maxwell, Napa, Napa County; J. E. Taylor, Grass Valley, Nevada County; J. T. Walsh, Auburn, Placer County; L. L. Clough, Quincy, Plumas County; Senator Chas. B. Bills, Sacramento, Sacramento County; R. P. Lathrop, Hollister, San Benito County; Mayor James Rolph, Jr., San Francisco, San Francisco County; Burton E. Towne, Lodi-North, San Joaquin County; J. T. Langford, Acampo-North, San Joaquin County; Martin Ansbro, Tracy-South, San Joaquin County; Ed Powers, Manteca, San Joaquin County; John S. MacBain, Menlo Park, San Mateo County; F. E. Mitchell, Campbell, Santa Clara County; J. A. Harvey, Santa Cruz, Santa Cruz County; A. H. Gronwoldt, Redding, Shasta County; W. I. Reding, Downieville, Sierra County; Lewis M. Foulke, Jr., Gazelle, Siskiyou

Rock Creek Bridge in Mendocino County.

Salinas River Bridge on State Highway near Soledad, Monterey County.

Bridge across Sacramento River at Redding.



Bridge across Sacramento River at Dunsmuir.

County; Thomas McCormack, Rio Vista, Solano County; D. H. Lafferty, Santa Rosa, Sonoma County; Charles S. Northcutt, Modesto, Stanislaus County; C. B. Harter, Yuba City, Sutter County; T. H. Ramsey, Red Bluff, Tehama County; C. H. Edwards, Weaverville, Trinity County; Charles Segerstrom, Sonora, Tuolumne County; Fred Shaffer, Woodland, Yolo County; C. W. Keel, Marysville, Yuba County.

That the work of these men was well done is proven by the fact that while the first State Highway bond issue carried by only 1.3 to 1 and the second a little better by 3.96 to 1, the third received a favorable vote in ratio of 7.03 to 1.

So it is that up to July 1, 1919, there has been voted by the people of California $73,000,000 for State Highways.

CHAPTER II

THE BUREAU OF HIGHWAYS

IN CONTEMPLATING this advanced sentiment for highway development in California it is interesting to go back to that time which marks the beginning of the agitation for a statewide system of good roads and we find that an act "to create a Bureau of Highways and prescribe its duties and powers and to make an appropriation for its expenses" was passed by the Legislature and approved by the Governor on March 27, 1895.

This act contained the following provisions:

"SECTION I. Within ten days after the passage of this Act the Governor shall appoint three competent persons to compose a Bureau of Highways who shall hold office for two years from the date of their qualifying. The persons so appointed shall be selected with particular reference to their qualifications for the duties devolving upon them; shall not engage in any other pursuit and shall devote their entire time to the service of the Bureau of Highways."

Section II of the Act provided for a $5000 bond for each commissioner to assure the proper performance of duty.

Section III relates to duties as follows:

"Among the duties of the Bureau of Highways shall be to gather from each county in the state statistics showing the total mileage of highways, their condition of improvement, the condition of the titles to the right-of-way, the method of obtaining title and of keeping the records thereof, the method of procedure in granting, closing and altering roads, and the manner of preserving the records of the same, the manner in which roads are constructed and maintained, the manner of payment for the construction and maintenance of roads, the manner in which the accounts pertaining to same are kept, the manner in which the money for highway purposes is raised, the amount expended in the past ten years for highway purposes with the rate of taxation on one hundred dollars that is apportioned to the road fund.

"It shall enquire into the topographical and geological features of each county, and more particularly with regard to the accessibility of water for road-sprinkling purposes, and stone quarries, deposits of gravel, bituminous rock, sand, adobe, or any other materials suitable for road-making purposes. It shall ascertain all laws now in force, in this state, appertaining to highways, and shall segregate all such as, in the judgment of the members of the bureau, are ineffective or obsolete from such as are effective. Inquiry shall be made into what laws and methods are in use in other states in regard to road matters and an abstract shall be made of such as are best adapted to the state of California. It shall prepare such cross sections of roads, plans for draining or watering of roads, and for culverts, small bridges and road appliances as may be deemed expedient. It shall prepare such blank forms as may be necessary to systematize all acts pertaining to the highways, and shall furthermore make any other inquiries in matters regarding highway improvement as will be of interest or benefit to the objects of said Bureau.

"Information and advice shall be furnished by the Bureau of Highways on matters connected with highway improvement and kindred subjects at any and all times, to all county officials or others connected with the highways, who may apply for the same, and any and all such information shall be furnished free of charge. It shall receive orders for road materials to be prepared at the state prisons, and shall forward the same to the governing body of the prisons, and in case the orders exceed the rate of supply shall make an equitable distribution of the product."

The section given has been quoted at length and it will be seen at a glance, in the light of modern road-building developments, that the Seven Labors of Hercules constituted an entirely trivial and inconsequential job when compared with the "duties" assigned to the Bureau of Highways.

In addition to the duties commented upon, it was further provided in Section IV of the act that: "One or more members of the Bureau of Highways shall visit each county in the state at least once in each year and shall hold therein a public meeting at which there shall be a public discussion of all matters relating to highways or highway improvement."

Other sections of the act provided for an appropriation for salaries and expenses and other minor details, a supplementary act being approved on March 28th in the same year, which authorized the erection and operation of rock-crushing plants at the state prisons, for the preparation of

highway material for the benefit of the people of the state of California, and provided for the necessary advances and appropriations of money to carry out said work.

The three men appointed by the Governor in compliance with the act establishing the Bureau of Highways were Messrs. R. C. Irvine, now living in Sacramento and a member of the Sacramento County Highway Commission, just finishing one hundred and twenty-five miles of concrete highways; Marsden Manson of San Francisco, one of California's foremost engineers; and J. L. Maude, now dead, who formerly lived in Riverside.

These three men were good roads enthusiasts all of them, and in commenting upon the work done by the Bureau of Highways, Mr. Irvine says that one of their first acts was to purchase a team of horses and to have a "buckboard" wagon of unusual strength built to order; the next being to embark upon the buckboard and sally forth for a first-hand survey of the state.

In furtherance of this laudable purpose during 1895 and 1896 the Bureau of Highways, represented mostly by Messrs. Irvine and Maude, drove into every county in California without a single exception, and in discussing this trip Mr. Irvine, who is shown seated in the accompanying picture, taken in Riverside County in 1896, directed attention to the dog, observing: "That's Maje, my Gordon setter who went with us, and he has a bone buried in every county in the state."

This statement may be accepted as indisputable evidence that the Bureau of Highways with its canine coadjutor visited every county in the state and moreover that Maje, at least, expected to return.

Be that as it may in relation to the bone-burying accomplishments of Maje, it is a fact that in 1895 and 1896 the Bureau of Highways drove seven thousand miles along the coast, through the valleys, over mountains, traversed the deserts and in a report submitted to the Governor under date of November 25, 1896, recommended a system of

The Bureau of Highways, R. C. Irvine in buckboard, J. L. Maude with camera, and Maje, Mr. Irvine's Gordon setter. Picture taken in Riverside County in 1896.

The Bureau of Highways found bridges like this on their trip over the state.

state highways consisting of twenty-eight proposed routes with the following comment:

"It will be observed by consulting any good map of the State, or the relief map of the State in the office of the Bureau, that the system of highways herein presented follows four fundamental principles:

"*First.*—They are laid out along those lines which the physical features of the State forever fix as the easiest lines of communication.

"*Second.*—The great belts of natural wealth which our State possesses are each traversed by one or more highways.

"*Third.*—The system connects all the large centers of population within the limits of the state.

"*Fourth.*—The system reaches the county seat of every county, and taps the line of county roads so as to utilize them to the fullest extent."

In submitting this report the Bureau of Highways prepared and filed therewith a map of the proposed highway system which in its main features corresponds almost exactly with the California highway system of today and discloses a breadth of vision that saw through nearly a quarter of a century and pictured what is now practically an accomplished fact, in all fairness entitling Messrs. Irvine and Manson, living, and Maude, passed on, to that respectful appreciation so seldom granted to the men who pioneer the way; for they left behind them footprints which lead up from the mist of the early nineties to the present when on almost every side smooth vistas of roads serve to help humanity advance.

Most of us who are devotees of good roads here in California have wondered, somewhat dimly perhaps, as to just what the impelling motive was that started our present highway development and here again we may turn to the Bureau of Highways which in 1896 published a bulletin written by Mr. Irvine.

"The Effect of Roads upon Industrial Development" was the title of this old time essay, which it is submitted is in all respects worthy of the most rabid good roads enthusiast of 1919.

"The influence of the bicycle," writes Mr. Irvine, "upon this agitation for improved highways cannot be overestimated. Millions of dollars have been invested in the

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"The influence of the bicycle," writes Mr. Irvine, "upon this agitation for improved highways cannot be overestimated. Millions of dollars have been invested in the

manufacture of these easy and graceful machines of locomotion and this agitation for better roads is due more directly to the efforts of the wheelmen than to any other one cause."

"Any machine," he continues, with perfectly unconscious humor, "which enables a man to travel with pleasure, without discomfort and practically without expense, forty miles a day, is evidently one which has come to stay and the number of wheelmen will surely reach extraordinary proportions in the years to come." Which, in this day when most of us have no little difficulty in confining our progress over highways to a speed of less than forty miles an hour, may be regarded as proof, after all, that the world really does move.

Farther on in his bulletin he declares: "In California, the conditions are so favorable to the construction of permanent roads that, with proper legislation, it can reasonably be hoped that the Golden State will set an example to all others in the Union," disclosing even so far back that modesty which is such a distinguishing characteristic of Californians, who will always joyously admit that their state is extraordinarily blessed.

"The absence of snow and frost," the bulletin continues, "obviates one of the great difficulties that must be contended with in the Eastern states and the presence throughout the state of excellent material for highway construction is a great aid to the advancement of the movement for good roads. The manifold reasons why wheelmen desire good roads are, of course, worthy of consideration but the fact must not be lost sight of that the farmer, the freighter, and the merchant need good roads to a greater extent than do the wheelmen, for over the highways must be hauled all that is produced, and the better the road, the more economically can products be transported."

As a result, no doubt, of the activity of the Bureau of Highways the press throughout the state took up the agitation for better roads, the Los Angeles *Times* of January 18, 1896, saying editorially: "If the state were to build a few

hundred miles of first-class highways the benefits would be so great and so apparent that the movement for good roads would be greatly accelerated and the people would cheerfully furnish the money necessary to continue the work until all the principal roads in the state were improved." While under date of February 4, 1896, the San Francisco *Call* declared: "There is something fascinating in the declaration made by a member of the State Bureau of Highways that it is the intention of the bureau to see that a finely macadamized highway is built from one end of the state to the other."

The San Francisco *Chronicle* of February 24, 1896, disclosed the activity of bicycle riders again, saying: "There is no doubt that the general interests of the state would gain by the success of the plan which the wheelmen propose for the improvement of the country roads. The design is to have the laws so amended that certain leading highways will be built and maintained by state taxation, and the less important roads, which serve the purpose of feeders, be maintained by the districts in counties. It is obvious that good roads would help production and trade as well as facilitate the pleasure of bicycling."

The Fresno *Republican* of November 24, 1896, declared itself characteristically: "Certainly it is time for a change in our road laws. We have been pouring money into that rathole long enough. The state needs good roads and the people are expending money enough to get them. The Legislature will do a good work this winter by acting along the lines recommended by the Bureau of Highways."

While the Stockton *Record* said: "Governor Budd does certainly voice one good suggestion in his message to the Legislature. He endorses a plan for a state system of highways and asks the Legislature to formulate some plan by which the state may gradually undertake the task of providing permanent, hard roads for thoroughfares."

A declaration made by the San Francisco *Examiner* of January 3, 1897, shows that paper boosting for good roads as consistently as it does now. "Hard, smooth, well graded

highways are essential in fruit-growing districts" was its statement, "particularly when fresh fruit is produced for Eastern shipment. These can best be secured by some such law as that proposed by the State Road Commission."

These expressions of editorial opinion seem to indicate a widespread public interest in road improvement which, as a matter of fact, dated even farther back than 1895 for we find that a good roads convention was held in the Senate Chamber in Sacramento under the encouragement of Governor Markham in 1893, at which a highway system was discussed but from which, unfortunately, no definite results appeared.

In tracing the history of the Bureau of Highways, the achievements of which appear creditable while cold documentary evidence testifies to the practicability of their plans, we find that the Act of 1895 was repealed by an act of the Legislature approved April 1, 1897, the Bureau of Highways dismissed and a Department of Highways established; Messrs. Irvine and Maude being dropped (perhaps for reasons having to do with politics which in those good old days was played close to the table) and Messrs. Marsden Manson, J. R. Price, and W. L. Ashe named commissioners. By this act it was provided that the three highway commissioners should hold office for two years at the end of which time their offices should automatically cease and all of the powers attaching to them should be vested in one man, who must be a civil engineer, to be appointed by the Governor and to hold office for a period of four years.

The highway commissioner appointed at the end of the two-year period designated by the statute was Mr. J. L. Maude, whose political fortunes at that time had dealt him the high hand, and as highway commissioner Mr. Maude served until 1903 when Mr. Nat Ellery was appointed, serving until 1907 when the State Department of Engineering was created. This was an advisory body made up of the Governor, ex-officio member and chairman, the State Engineer, the General Superintendent of State Hospitals, the

Note.—This is a reproduction of the map prepared by the Bureau of Highways in 1896 showing the State highway system they recommended. Original map was in two colors.

Sketch Map
—OF—
California.

OUTLINING THE STATE HIGHWAY SYSTEM

RECOMMENDED BY

THE BUREAU OF HIGHWAYS.

State and County Boundaries, Etc., Shown in Black.

Highway System in Red.

Prepared in the office of the Bureau of Highways.

J. H. WATKINS, DEL.

THIS system intersects the great belts of wealth in the State, traverses every county, reaches every county seat and all centers of population, and is projected on the best grades possible.

Note.—This is a reproduction of the map prepared by the Bureau of Highways in 1896 showing the State highway system they recommended. Original map was in two colors.

MONTEREY
SAN LUIS OBISPO
SANTA BARBARA

chairman of the State Board of Harbor Commissioners of San Francisco, these men all serving ex officio, and three other members specifically appointed by the Governor, the whole board to carry out such duties as were or might be provided by law. The State Engineer under this act was Mr. Ellery who, with his confreres, no doubt did the best he could, but inasmuch as no particular amount of money was supplied for road-building purposes no remarkable amount of permanent road building was done.

The same conditions which confronted Mr. Ellery in his work have hampered the present State Engineer, Mr. W. T. McClure, who, with his principal deputy, Major P. M. Norboe, has been charged until recently with the care of certain State roads but not provided with any funds therefor.

It may not be out of order at this point to say that of all the various agencies intervening between the Act of 1895 and the act creating the present California Highway Commission, no one of them seemed to get down to the brass tacks of a real State Highway plan quite so closely as the Bureau of Highways and no individual in that time wielded quite so prolific or facile a pen as did Mr. Irvine, whose writings upon the subject of roads form no unimportant part of the documents treasured in the State Library of California, which may appear strange when it is known that Mr. Irvine's literary education consisted in driving a freight team between Sacramento and Virginia City, Nevada, in which he engaged when he was fifteen years old, remembering even to this day with painful clearness that the toll between the points named, over privately owned roads was $25 for a double team. Perhaps the fact that Mr. Irvine was born in Missouri may have had something to do with the matter for that derided state has produced some entirely worthy writers as well as other great men.

CHAPTER III

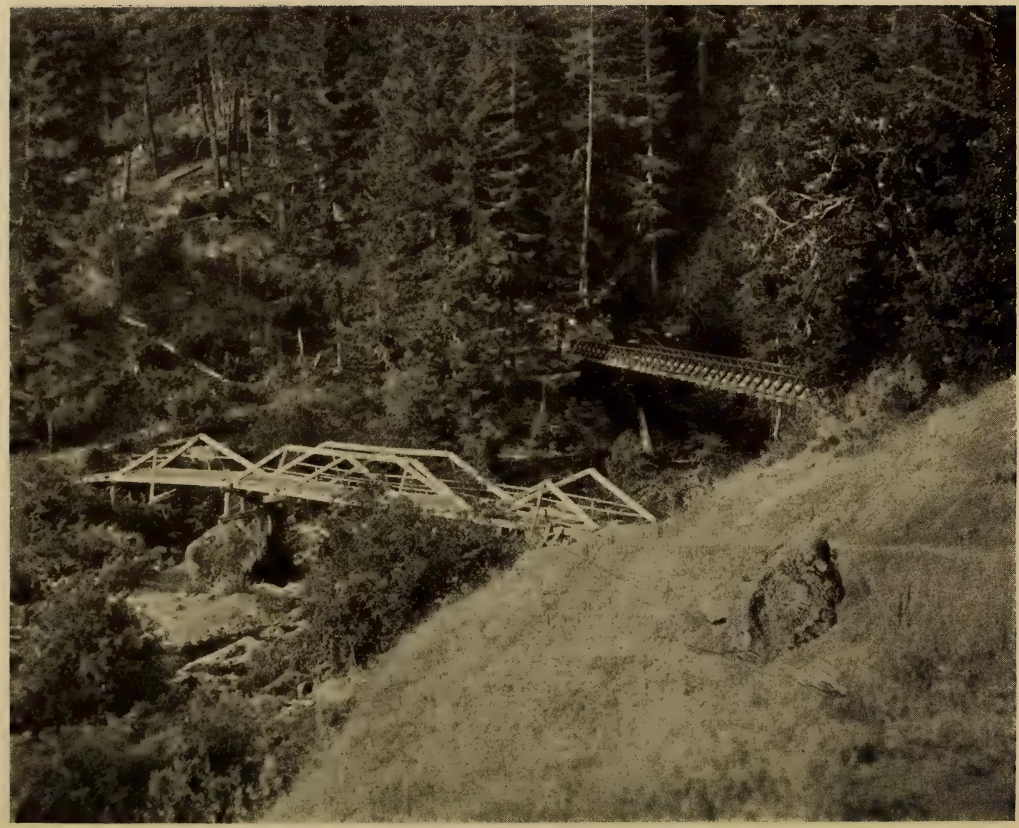
STATE ROADS

FOLLOWING the creation of the State Bureau of Highways various state roads have been from time to time created by legislative enactment. These roads were not originally a part of the State Highway system even though now taken in under an act of the Legislature of 1917, and it seems proper to consider them at this point. They were as follows:

1. THE PLACERVILLE-LAKE TAHOE ROAD was originally a toll road incorporated as the Lake Tahoe Wagon Road beginning near Smith's Flat, three miles east of Placerville, and extending eastwardly to the state line, a distance of sixty-five miles. It was taken over by the state in 1895 and is one of California's historic highways over which flowed the variegated travel of "the days of '49."

2. THE MONO LAKE BASIN STATE ROAD came into being only after a stormy fight extending over a period of years by the people of Inyo, Mono, and Alpine Counties, who demanded a direct route over the Sierras to the Sacramento and San Joaquin valleys, their struggle being finally crowned with success in 1899 when the Legislature ordered the Department of Highways to construct a "free wagon road connecting Mono County roads with the Tioga road." The Tioga road, it may be said, was originally built by the Great Sierra Wagon Road Company, a subsidiary of the Great Sierra Consolidated Silver Mining Company which was engaged in exploiting the Tioga Mine. It was a toll road operating under franchise from Tuolumne County and supplied a short cut over the Sierras from Mono Lake Basin, continuing in operation as a toll road until 1915 when fifty-three miles lying within Yosemite National Park was

On the Lake Tahoe wagon road; the first highway taken over by the State.



On the Peanut road, showing old bridge and new.

acquired by the Government, the seven miles between the park boundary and the Big Oak Flat road being acquired by the state upon condition that Tuolumne County would terminate the franchise of the toll road company which was done.

At the same time another act was passed declaring the Big Oak Flat road, which was also a toll road, part of the State Highway upon condition that Tuolumne County acquire and transfer it to the state together with the county road which formed a connection with the Sonora lateral of the State Highway at a point near Chinese Camp, these various roads now supplying a State Highway lateral from the valley trunk line at Salida, just above Modesto in Stanislaus County, to Mono Lake, fifty-three miles of the route being under government control in Yosemite National Park, a branch road extending from Sequoia, through the Tuolumne Big Tree Grove to Cascade Creek, about five miles from the Yosemite Valley, being owned by State and Government, eight of the fourteen miles involved being within Yosemite National Park.

3. The Sonora-Mono State Road was formerly a toll road extending across the mountains from Sonora, Tuolumne County, to Bridgeport, Mono County, built to serve travel when mining was at its height but allowed to fall into disuse and disrepair as time went on until in 1901 it was taken over by the state and two years later $4000 was appropriated to put it in repair, this sum being ridiculously inadequate to rehabilitate seventy-eight miles of dilapidated road. In 1905, $28,000 was appropriated by the Legislature, and in 1907 a further appropriation of $12,000 was made, these two appropriations serving to make the road fairly passable perhaps owing to the fact that a power company developing reservoirs in the Tuolumne River canyons got tired of the state's delay and chipped in, building at its own expense and with no thanks, thirty-eight miles of the road.

4. The Trinity-Humboldt Road originated in 1903 when an appropriation of $1800 was made for a survey of a road from North Fork, Trinity County, to a point near

China Flat in Humboldt County, which was followed in 1907 by an appropriation of $50,000 "to connect the roads of Humboldt County with those of Trinity, Shasta and Tehama Counties," the "Mad River Low Gap" route being finally selected and the road being open today forming a connection thirty-three miles long between the road systems of the counties named, supplying a direct connection with the Sacramento Valley for Humboldt County where none existed as well as opening up a way to the quaint mountain town of Weaverville, the county seat of Trinity, for residents in the lower part of the county whose travel previously had been on horseback over trails that would shock a Rocky Mountain goat. This road is thoroughly worth while essaying, is easily travelable, and discloses that variety of interest which always attaches to a step aside from beaten paths.

5. The Kings River Canyon Road. This stretch of state road which was established by act of the Legislature in 1906 promises some day to be one of the famous and popular touring trips of the state and connects the Fresno County road system at General Grant National Park with the little known Kings River Canyon which, in point of scenic splendor, stands little if any below Yosemite.

6. The Sierra State Highway. This road was authorized by the Legislature in 1907 and an appropriation of $12,000 was made for surveys and construction work. It covered the distance of twenty miles between Downieville and Mount Pleasant, apparently serves no important purpose, and is not worth considering at any length.

7. The Auburn-Emigrant Gap State Road. Most of the grade of this much-traveled road was built by the Central Pacific Railroad during construction of its line, being put in to make possible the hauling of supplies to its right of way. With the Emigrant Gap-Donner Lake road (No. 12 of the roads under consideration) it forms one of California's most famous roads and will, in time, be one of the main summer highways into Nevada and the east.

8. The Alpine State Road. In 1911 various county

roads of El Dorado, Alpine, Amador, Calaveras, and Mono Counties were taken over by legislative enactment under state control, aggregating two hundred and seventeen miles and rambling generally about the central eastern portion of the state, being intended it may be concluded, as the section traversed is one of the most picturesque in the state, to supply an intrastate tour which, in spite of lack of funds for either repair or maintenance, has grown popular and shows an increasing volume of automobile travel each year. For purposes of convenience it may be separated into four divisions as follows:

Alpine branch—From Osgoods, on the Placerville-Lake Tahoe road, through Markleeville to Mount Bullion.

Calaveras branch—From Bullion through Ebbitts Pass to the Calaveras Big Trees.

Amador branch—From Jackson, Amador County, by way of Carson Pass connecting with the Alpine branch at Picketts in the lower end of Hope Valley.

Mono branch—Running from Little Antelope Valley to a connection with the Sonora-Mono road on the east fork of West Walker River.

When constructed, as it no doubt will be owing to the fact that touring road development is part of the present California plan, the Alpine state road will constitute one of those attractive motor trips which are serving to bring more automobile owners to California every year.

9. The Lassen State Road. This road was established in 1911 and runs from the Shasta County line near Pittville east and north through the northwest corner of Lassen County, passing through Bisbee to the Modoc County line a few miles south of Adin. It now forms part of the Alturas lateral of the State Highway.

10. The Myers-McKinneys State Road. This road, provided for by the Legislature in 1911, was intended to supply access from the Placerville-Tahoe road to McKinneys on Lake Tahoe, and the intent of the men responsible for it has been admirably served as will be understood when it is known that in 1911 tourists desiring to pass from one end

of Lake Tahoe to the other, either by wagon or automobile, were compelled to either ferry thirty miles by barge, or make the trip by way of Carson City and Reno in Nevada and then back through Truckee, California, a distance of more than one hundred miles.

11. The McKinneys-Donner Lake State Road. In 1915 the Legislature placed under state control this road connecting the last named road with Tahoe City and thence through Truckee to Donner Lake where it connects with the Emigrant Gap state road and supplies one of the state's most famous drives.

12. The Emigrant Gap-Donner Lake State Road. Beginning at Emigrant Gap, where it connects with the Auburn-Emigrant Gap road taken over by the state in 1909, this road reaches Donner Lake, Truckee, and Lake Tahoe. From Truckee a road is provided by the 1919 state highway bond issue to Verdi on the California-Nevada line, in part down the canyon of the Truckee river, in part over what is known as the Dog Valley grade.

13. The Tahoe-Crystal Bay State Road. This road, provided for in 1915 by legislative enactment, was intended to supply the last link in a state road beginning at the California line on the north end of the lake and following the shore line to its connection with the Nevada state line to the south, an undertaking worth while from every viewpoint and supplying access to lakeshore home sites within the Tahoe National Forest, suitable for summer residential purposes, which may be leased for a few dollars a year from the Government.

14. The Yolo and Lake Highway, created by the Legislature in 1915, commences at the town of Rumsey in Yolo County and follows the meanderings of Cache Creek into Lake County, where it ends at the town of Lower Lake. This road reaches into a desirable agricultural area and one exceptionally interesting from a touring standpoint, Lake County being so isolated in its situation and so limited in its funds as to need state help in its road problems. With sufficient funds the Yolo and Lake Highway may be made into

The Tejon-Castaic Ridge Route, commonly called the Ridge Route, follows the mountain crest for miles and is all paved with concrete. It is one of the big undertakings of the California Highway Commission.

Guard rails, paved curbs and a wide pavement supply a satisfactory safety element that serves to make travel over the Ridge Route doubly attractive.

a cross-state connection between coast and valley lines of the State Highway.

15. The Big Oak Flat Road. Taken over by the state under the Act of 1915, this road, thirty-two miles long, from Jack Bell sawmill to Cascade Creek was formerly a toll road and was acquired by Tuolumne County and transferred to the state. It forms one of the popular entrances into the Yosemite and is properly under state control, the main burden of its traffic being supplied by outside tourists rather than by people resident locally.

16. The Kern-Ventura State Highway. Not forming a part of the State Highway as laid out by the State Highway Commission this road owes its origin to legislative enactment in 1915 which provided for the survey and location of a highway from a point in Kern County south of Bakersfield to the town of Nordhoff in Ventura County, where connection is made with an already established and splendidly planned system of county highways. No funds have been supplied for this road and there is little chance for its development in the near future.

17. The Pasadena State Highway. Another of the group of roads designated by the Legislature in 1915 and intended to connect La Cañada Valley with Antelope Valley, both in Los Angeles County. This highway has its origin near La Cañada and follows the Arroyo Seco to a point east of Hoyt's Ranch, thence by way of Tujunga Canyon, Mill Creek, Tie Canyon, and Kennedy Springs to Vincent.

In addition to these "state" roads, established by special acts of the Legislature and therefore treated separately from the State Highway, other roads have been accorded state aid by legislative enactment, there being three of these, of which the Pescadero-Redwood Park road established in 1915 is the only one of any importance. This road runs from Pescadero in San Mateo County to Redwood Park in Santa Cruz County and when completed will be, by all odds, the most attractive drive within a day's journey of San Francisco, enabling the motorist to travel from San Francisco down the San Mateo County ocean shore road, via Pesca-

dero, over the La Honda road to Redwood Park, thence into Santa Cruz by the Boulder Creek road and back over the mountains by the State Highway, passing Saratoga, Los Gatos and thence to San Francisco by way of the beautiful Santa Clara Valley. The development of this road is predicated upon county help, and it may be said that the counties involved have done their full share.

The second in importance of these state aid roads is that extending from Alturas to Cedarville in Modoc County for which the state appropriated $7000 contingent upon the expenditure of $3500 by the county, both sums having been spent without the accomplishment of any particularly surprising results.

The remaining road, two miles long, was across Middle Lake in Surprise Valley, Modoc County, a fill being made across the shallow lake, and a state appropriation of $20,000 being provided to help in the expense, which was justified apparently on the theory that it would form a connection at its east end with a county road "leading into Nevada." The appropriation was exhausted before the work was done and the future development of the road is at present one of the white man's burdens resting upon Modoc County.

With little doubt these roads will be, as the seventeen state roads above described have been, put under the jurisdiction of the State Highway Commission as part of the State Highway scheme but, inasmuch as all these roads were created by legislative enactment rather than as a result of any action upon the part of the State Highway Commission, it has been thought best to discuss them separately.

CHAPTER IV

THE CALIFORNIA HIGHWAY COMMISSION

With the roads considered in the preceding chapter forming, as they undoubtedly do, a connecting link between the original Bureau of Highways and the present California Highway Commission, and therefore meriting consideration, attention may be devoted to that state organization now engaged in developing our state roads. This body owes its origin to a bill approved by Governor Gillett on March 22, 1909, which authorized the construction, acquisition, maintenance, and control of a system of state highways, Section 10 of this act providing that: "This Act shall be submitted to the people of the state of California for their ratification at the next general election to be holden in the month of November, 1910, A. D."

Governor Gillett had long been a good roads enthusiast, and in the preliminary and tremendously important stages of that work, which was to result in giving California a splendid system of state roads, had thrown the undoubted strength of his personality back of the movement and was responsible in great measure for the successful passage of the bill which, as has been said, was passed on November 8, 1910, by a majority so small that in the light of subsequent road-building developments it can scarcely be explained.

On the same day Hiram Johnson was elected Governor and to him also, in no small degree, is California's splendid system of state roads due, for, whenever difficulties developed or obstacles intervened, he was always on hand to take part in the fight, which is saying a great deal, for Governor, now Senator, Johnson is a militant soul who does not particularly detest warfare and, win or lose, always has the other

side convinced that it has been in an honest-to-goodness fight.

The first step taken in the establishment of the present system, aside from the legislative preliminaries involved, took place on the eighth day of August, 1911, when the Advisory Board of the Department of Engineering of the State of California met at the Governor's call in his office in Sacramento, the following persons being present: Hon. Hiram W. Johnson, Governor and ex-officio member and chairman; Mr. Nat Ellery, State Engineer; Mr. J. J. Dwyer, Chairman of the State Board of Harbor Commissioners of San Francisco; Dr. F. W. Hatch, General Superintendent of State Hospitals; and Messrs. Charles D. Blaney of Saratoga, Burton A. Towne of Lodi, and N. D. Darlington of Los Angeles, the three appointed members. At this meeting the following resolution was passed:

RESOLVED, That the appointed members of this Board, to wit, Messrs. Charles D. Blaney, Newell D. Darlington and Burton A. Towne, be, and they hereby are, appointed a committee to be known and designated as the California Highway Commission with the jurisdiction and powers following, to wit:

1.—To take full charge of the entire matter of the construction and acquisition of a system of state highways in and for the state, as and in such manner provided by law, at a cost not to exceed the sum of $18,000,000 under and in pursuance of the Act of the Legislature of the State of California approved March 22, 1909, and known as the State Highway Act and to do and perform as fully and completely as may be done by any part, or representative, or committee of this Advisory Board, every act and thing that may be requisite to be done and performed in connection with the highways of the State of California or that ought to be done and performed under the said State Highway Act.

2.—To do and perform every act and thing in and about the premises that a committee of this Board may be lawfully authorized to do for or on behalf of this Board; and to have full charge and control of the acquisition and construction, of the laying out and the building of a system of such highways.

3.—To report from time to time to this Board their actions and proceedings and to submit to this Board for determination such matters as the law requires this Board to act upon; and to superintend the work and operations of the Highway Engineer whose appointment is provided for by the Act of the Legislature of the State of California, approved April 8, 1911.

This picture of the Yolo Causeway shows the final stages of construction work when a lift bridge was being put in to supply a passage for dredges used in reclamation work in the Yolo Basin.

This picture shows in somewhat exaggerated form the superelevation of curves now supplied in State Highway construction work.

4.—To perfect such organization as they may deem necessary to carry on with celerity and efficiency the work to be done in the matter of the acquisition and construction of the said system of State Highways, and under said State Highway Act; and generally to do all and singular every act and thing that may be necessary for the due, speedy and efficient performance of all that may be required under the said State Highway Act, and under the Act of the Legislature of the State of California approved April 8, 1911.

Which, stripped of its dry, legal verbiage, meant that Governor Johnson and the State Board of Engineering had selected Messrs. Blaney, Darlington, and Towne, the three members of the board not serving ex officio, to undertake the work and assume the tremendous responsibilities of building the State Highway. When this commission was called together by the Governor he said bluntly, and, it may be added, truthfully, in the light of after events: "Gentlemen, you face a tough job. You are expected to build for eighteen million dollars a highway system that the best engineers of the country have estimated will cost from thirty-five to fifty millions."

In justice to the gentlemen named it may be said that the magnitude of the job did not terrify them in the least. They were all men of affairs. Each had made good in his own particular line of effort, and as a committee they took up, with Mr. Towne as chairman, under the statutory compensation of $3600 a year each, what was probably the biggest road-building job of modern times—none of them particularly interested in the salary but each resolved to give of his best for the advancement of the state which all desired to serve.

Under the provisions of the Act which had resulted in their appointment it was directed that: "The highway constructed or acquired under the provisions of this Act shall be permanent in character and be finished with oil or macadam or a combination of both or of such other materials as, in the judgment of the said Department of Engineering, shall be most suitable and best adapted to the particular locality traversed." Which, in all conscience, afforded them ample latitude to sink or swim.

To secure a competent road-building engineer for the California Highway Commission was no easy task, for upon this man the success or failure of the plan must needs depend. Highway engineers there were in plenty who would have liked the job—men of satisfactory standing in their profession who had made good in other states—but in seeking the right man, some engineer who was big enough to establish precedent rather than follow in the footprints of other men, Governor Johnson, upon whom rested the responsibility of choosing, settled upon a highway engineer who had been brought to California from Massachusetts to deal with the road-building problems of San Diego County.

This man was Austin B. Fletcher, who had served the Massachusetts Highway Commission and had been special agent of the United States Bureau of Public Roads. During his connection with the Government bureau Mr. Fletcher had written a bulletin which the Office of Public Roads accepted as authoritative and published widely under the title, "The Construction of Macadam Roads," this being in 1906 in the days when concrete road building was practically unknown, the resultant publicity given the author securing a widespread reputation for him.

At any rate, so thoroughly had Mr. Fletcher achieved the confidence of the Bureau of Public Roads, the Massachusetts Highway Commission, and San Diego County that the Governor felt no hesitancy in appointing him to the responsible position of Highway Engineer and since that time, in spite of criticism and freely offered declarations in the earlier stages of the work that he was headed for failure, Mr. Fletcher has made good, evolved, if you please, what has come to be widely regarded as a more or less distinct plan of road building popularly known as the California type.

Since his appointment Mr. Fletcher has been continuously on the job except for a short time in 1916, when the Government borrowed him to assist in formulating a plan for the expenditure of $160,000,000 Federal and state road moneys under what is known as the Bankhead Bill, which was a compliment to California, not to mention Mr. Fletcher.

The California Highway Commission

At the very start the newly appointed California Highway Commission faced tremendous difficulties, the least of which was involved in creating an office organization that could spend millions and account for them to the last cent. In addition a field force must be gathered and endowed with that *esprit de corps* without which no big undertaking can sail toward success. So efficiently was this done that today of the seven division engineers of the California Highway Commission, originally employed, only two have left and of these, Mr. A. E. Loder, in the language of the small boy which exactly fits the case, was "swiped" from California by the United States Bureau of Public Roads, which governmental office he is serving today as one of the principal assistant engineers, while Mr. Walter C. Howe, resigning to enter the service of his country in the army, preferred to remain in private life.

In planning the undertaking that was charged to it the Highway Commission was allowed ample latitude as to route, the provisions of the statute being that:

"The route or routes of said state highways shall be selected by the Department of Engineering, and said routes shall be so selected and said highways so laid out and constructed or acquired as to constitute a continuous and connected state highway system, running north and south through the state, traversing the Sacramento and San Joaquin valleys and along the Pacific coast by the most direct and practical routes, connecting the county seats of the several counties through which it passes, and joining centers of population together with such branch roads as may be necessary to connect therewith the several county seats lying east and west of such state highways."

A glance at the State Highway map of California today shows how the commission analyzed the language of the bill and, having formed their general plans as to the layout of the roads, they started out to look things over for themselves. With the Highway Engineer they traveled up and down the state and circulated around quite promiscuously, following the probable roads and visiting different counties many times, picking up the county surveyor here, a member of the Board of Supervisors there, a good roads booster in another place, and insisting always upon being shown, by someone

who knew the roads of the particular locality, what might prove to be a better route than that which they had tentatively settled upon.

This trip was made by automobile, and all Californians will admit that it comprehended the most beautiful scenic section of America, but it was far from being a pleasure jaunt according to Commissioner Blaney. "We started out," he told one of his friends, "to find if it was possible to abolish many of the natural barriers and run two big trunk roads from Oregon to the Mexican line, with no greater grade than six per cent. We covered six thousand eight hundred fifty miles on our tours. We were kicked off mountain roads by mules, we were stuck in river fords, we slid around dangerous mountain grades, we broke our windshield and punched holes in the bottom of our gasoline tank on the rocks on the desert, and after we had covered the trunk lines and laterals of California from Oregon to Mexico we went back to Sacramento and drew the State Highway routes on a big map of the state." In other words, the State Highway was planned as the result of an actual observation of the state's needs by the commission and its engineer and largely followed, it is only justice to state, the system mapped out by the original Bureau of Highways after their peregrinations with the buckboard and old Maje.

The state was districted and seven divisions established, each in charge of a division engineer. Then the actual work of survey began. Through the valleys planning roads was comparatively a simple matter, the theory followed being that the shortest distance between any two given points is a straight line. In the mountains, however, was different, for there the selection of a route is, as a rule, controlled not by centers of population but by the topography and geology of the country to be traversed. The location of mountain roads, it may be said, is fraught with a multitude of obstacles which can be surmounted only by the application of certain engineering principles, unstinted physical energy, and a vast amount of common sense. To be successful the field engineer must not only be vigorous mentally and physically but

Pouring a concrete road from a barge. This novel method of construction was used along the Sacramento river levee.

A fair example of the obsolete oiled dirt road.

be technically proficient as well. Aside from being an engineer he must be a woodsman endowed with the faculty of arising to any emergency in connection with the establishment of camps and transportation of supplies. It is needless to state that this type of engineer is scarce, for, as has been aptly declared, "Nature rarely combines mathematical talent with the practical tact and observation of outward things so essential to a successful engineer."

Be that as it may, and undoubtedly men of the type that laid out the mountain stretches of the State Highway are hard to get, none the less the California Highway Commission secured them and the roads they selected and located stand as a monument to them today. With that success which only can be arrived at by utter forgetfulness of self, they threaded canyons where they were forced to swing like spiders from a slender thread or traced their way along the backbone of mountain ridges through almost impenetrable thickets of mountain brush, making camp where night overtook them and depending upon pack horses for their supplies and water for themselves and stock.

In valley locations, also, difficulties were encountered that required enthusiasm to bridge, vast stretches where at certain seasons of the year the snow waters of the Sierras made inland seas, places where drifting sands in dunes that lifted many feet crept onward in ceaseless march, quicksands and stretches along ocean shores where the road must run in almost actual contact with the waves, deserts where the nearest water was, perhaps, a hundred miles, the sun beating down in almost overpowering heat, and where the depth was hundreds of feet below the level of the ocean—these were the problems that confronted them.

Romance, it might be said, was built into the roads that they laid out, for that stretch of highway reaching from San Francisco to San Diego by way of Los Angeles followed the line of the King's Highway (El Camino Real) laid out by the padres when California was Spain, while other roads traced their way into the land of Bret Harte, Mark Twain, and the old-time mining districts of the days of '49. And aside from

that there was that other romance which is inseparable from the accomplishment of a big undertaking; of difficulties met face to face and conquered merely as a part of the good day's work.

In a comparatively short time, less than a year after actual work began, more than one thousand miles of highway had been surveyed and the actual work of construction faced the California Highway Commission and its engineer, the funds supplied them being about one-third sufficient to do the job. Involved in this was a wealth of detail, such as rights of way and bridges, and the resourcefulness of the commission developed by its need for stretching dollars was fairly and squarely tested, the result being that, with scarcely an exception, the counties furnished these important elements, rights of way and, in most instances, bridges which must be supplied before work could begin. In the words of one of the Highway Commission's engineers, "splendid co-operation was had from all sides," and to this splendid co-operation the commission modestly attributes its success, which means that the boards of supervisors of nearly every California county put up money to help the Highway Commission in its work.

CHAPTER V

TYPE OF ROAD AND CONSTRUCTION

DURING all the preliminary undertakings the proper type of road to build was being considered and the final decision made that concrete was the only road which would comply with the statutory mandate as to permanency, so concrete roads were planned. Discussing the element of permanency it is well to quote from Mr. Fletcher. "At the outset," he wrote, in replying to a correspondent early in the history of the State Highway, "I have to confess that I know of no type of pavement which can be truly called 'permanent,' and the expression must be considered as relative only. I know of no pavement or roadway which does not require from the day it is constructed more or less expenditure for maintenance. If no other work is needed for the first few years, the roadsides, gutters, and culverts must be looked after."

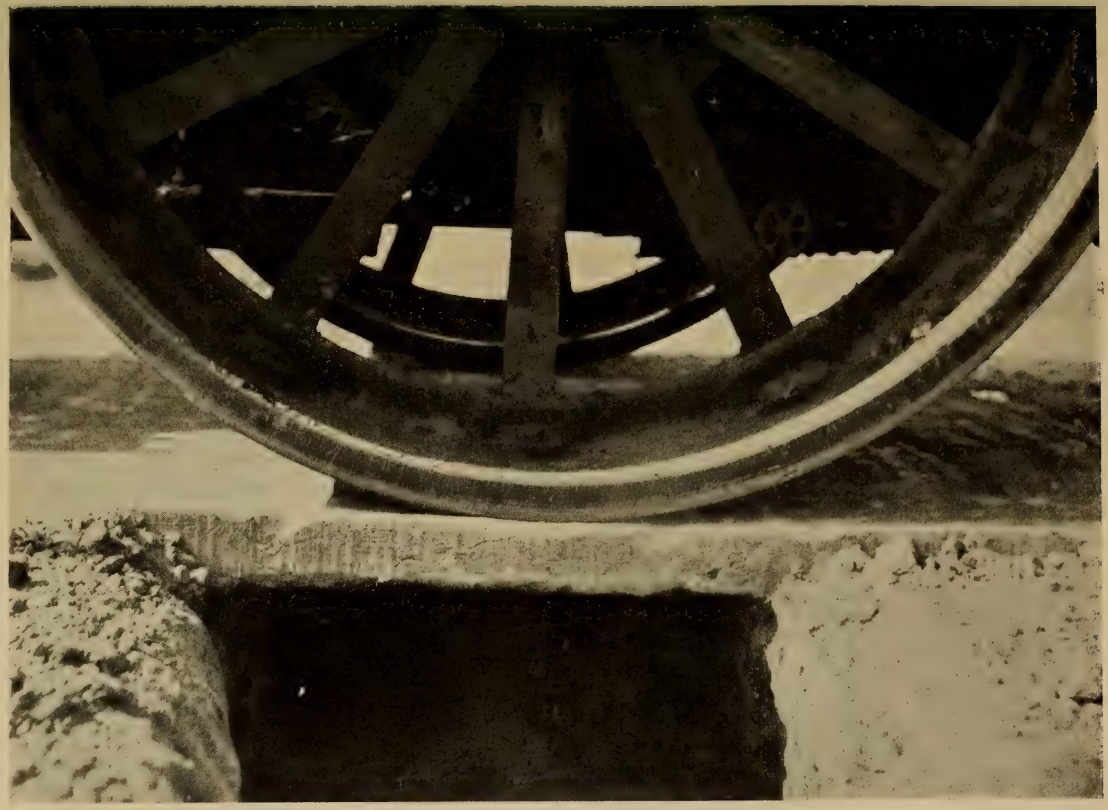
The specifications for construction work adopted by the Highway Commission for its start in concrete road building called for a mixture of concrete, consisting of one part Portland cement, two and one-half parts of sand, and five parts of stone, one and three-tenths barrels of cement being required for each cubic yard of concrete, this mixture providing a pavement of unusual strength, it was declared. To demonstrate just how strong it was, some crude but practical tests were made of a pavement thirty-five days old of unsurfaced concrete, four inches in thickness, the standard established when the start was made in building concrete roads. Preparatory to the tests the earth was removed from under the concrete pavement for a width of two feet and extending in four feet from the edge. The tests were made

with a so-called ten-ton Kelly-Springfield roller, which was so designed that one-third of the load rested on each rear wheel, the rear wheels being twenty inches wide.

In the first test the roller was run along the road, its rear wheel crossing the unsupported concrete twelve inches clear of the edge of the pavement. The second test was like the first except that the wheel was but six inches clear of the edge of the pavement. In the third test the roller was stopped and started with the rear wheel on the unsupported concrete, six inches from the edge of the pavement. There was no noticeable effect on the concrete in any of the first three tests. In the fourth test the wheel was passed over the unsupported concrete with its side even with the edge of the pavement and in the fifth it was made to pass over a block of wood 2 x 4 x 8 inches, laid flat twelve inches from the edge of the pavement and lengthwise with the road. A slight deflection was noticeable in both the fourth and fifth tests as the roller passed over the opening, but the concrete regained its original position immediately after the passing of the roller.

Assuming that the weight on the block of wood was three and one-third tons only (it was nearer four tons probably, as the roller carried fuel and water), the load resting upon the concrete paving four inches thick was equivalent to 1666 pounds per inch of width of bearing, the equivalent of a wagon with four wheels, each with four-inch tires, carrying a load of thirteen tons equally distributed over the four wheels; this load being about four times what the pavement might be expected to carry under the heaviest traffic—assuming this to be a twenty-ton traction engine which, if of standard size wheels, would only impose a weight of 555 pounds per inch.

These tests achieved quite wide publicity and served to satisfy the public as to the value of the four-inch concrete road which, it may be said, has proved satisfactory after a usage of more than five years on all highways save those where the traffic is great in volume and heavy in individual units. On these it has proved hardly thick enough, the



One of the early concrete road tests of the State Highway Engineers. Sixteen hundred and sixty-six pounds weight to the inch on an unsupported four inch concrete slab.

Type of bridge built by County cooperation on the State Highway in the San Joaquin Valley.

Surfacing the Yolo Causeway.

present plan providing for a minimum of five inches, with six inches where the subgrade is bad.

Encouraged by the success of the type of road laid down by the Highway Commission, many counties throughout the state began to build concrete roads, accepting mostly the State Highway specifications as to mix and thickness, so it may be fairly stated that the era of modern highways in California was born with the starting of the State Highway.

Thousands of pages of technical and detailed information would scarcely serve to present the many and widely varied processes met in the actual construction work of the State Highway, which varied from the most intricate legal problems involved in the practice of eminent domain to the applied psychology incident to bringing some stubborn supervisor or chamber of commerce to what was equitable and right. To say that the Highway Commission had easy sailing would be far from true, for they had many a fuss with this or that individual or organization, one row with a number of contractors engaged in city paving work upon a large scale becoming notable. On February 7, 1913, these men addressed an open letter to the Governor declaring that the then bituminous wearing surface which the commission had specified for about one hundred miles of work was not permanent, and advocating a wearing surface of bituminous material not less than two inches thick. After full investigation the Governor responded in effect that he was satisfied the commission knew its business and closed the controversy for all time.

The standard width of road adopted by the Highway Commission was fifteen feet, wider roads up to twenty-four feet being supplied where such volume of traffic existed as to justify.

Naturally, as the California highway system developed and knowledge of concrete road building was augmented by experience certain variations took place, until at the present time it may be said that a one-two-four mix is commonly in use, an increase of twenty-five per cent in the amount of cement used, while the thickness of the roads has been

increased to a minimum of five inches, with six-inch pavement and transverse metal reinforcement of three-eighths-inch steel bars provided in such places as unsatisfactory subgrade conditions exist, as, for instance, adobe soil, that is prone to swell and shrink and crack.

Under the original plan the roads were flat on curves and conformed to the standard width of fifteen feet, but with the development of road-building experience which has taken place among the engineers of the Highway Commission curves are now being widened, additional concrete being poured on the inner side, and also being banked, in common parlance, or, according to engineers, given a superelevation, the rise on the outside not being by any means such as the cold mathematics of highway engineering would call for; merely a slight tilt in the pavement to the outside of the curve, which makes travel vastly more pleasant and at the same time contributes a factor of safety such as a flat curve does not possess.

Poured concrete curbs on the inside of curves also have been provided, which, while furnishing a certain sense of security, are chiefly valuable because they have a tendency to prevent a flow of water and consequent erosion, in some places spillways being provided to carry off storm water where conditions are such as to make them necessary.

In laying down the concrete roads which it had adopted as standard for its work the matter of some surface or carpet treatment to prevent that wear which would inevitably result from iron-shod traffic engaged the attention of the Highway Commission's engineers and they finally adopted two methods of surfacing, one of these providing for a protecting surface, three-eighths of an inch in thickness, of asphaltic oil and fine crushed rock screenings, the other for a heavier protective covering, one and one-half inches in thickness, of asphaltic oil and rock up to half an inch in dimension.

Over this method adopted by the State Highway Commission for protecting the concrete pavement it had laid arose the row referred to in the present

chapter, which, as has been said, went up to the Governor without effect, the opinion expressed by California's Executive being that the engineers of the Highway Commission knew a heap more about the technique of road building than he did and that he was not inclined to meddle in their affairs.

Since that time the engineers of the Highway Commission have continued in the practice they started with, changing from asphaltic oil to one of the different grades of asphalt and getting a protective covering which has served fairly well, the plan of surfacing the concrete highways laid down being firmly adhered to and the tendency being to supply the best protective carpet consistent with economy.

In the work of developing a highway system for California the State Highway Commission took over various roads that had been previously improved by counties and, it may be said, in doing so inherited a lot of grief, for these roads were mainly of oil-macadam construction—such as had been paved—which wrinkled up, like the skin on an elephant, under the growth of motor-driven travel, where a direct thrust is imposed upon road surface by heavy hind wheels, and gave birth to that statement which even now continues to crop up, that "the State Highway is going to pieces," this declaration usually emanating from that individual who contends that earth roads were good enough for his "pappy" and forgets that the world has moved.

These oil-macadam roads, laid under some of the earlier county bond issues, still remain in stretches, but are gradually being torn up and replaced with concrete, and under the $40,000,000 bond issue of 1919 provision has been made for the replacement of all remaining stretches of oil-macadam and the development of concrete pavements upon all stretches of the State Highway where traffic conditions justify.

To the ordinary layman "permanent road improvement" implies a far-stretching and smooth expanse of concrete paving, and no doubt today there are many people in California who have a mental picture of the entire State Highway system in such shape, while as a matter of fact no such

possibility exists, owing to the fact that vast stretches of the State Highway are in mountainous regions where scarcely any road burden outside of light neighborhood or tourist traffic exists and where pavement of concrete would be an inexcusable waste of funds.

In these sections, however, the State Highway Commission has done permanent road work of the best kind, establishing engineering lines with grades of small per cent, shortening distance, eliminating the up-and-down roller-coaster effect so common in country road building, putting in a culvert here, a bridge there, and paying attention generally to those technical details of road location, alignment, drainage, etc., which combine to supply good mountain roads. Local material in many different mountain localities has been found and used for surfacing, with entirely satisfactory effect, and a standard of road width established which contributes not only to the pleasure of travel but supplies a factor of safety as well.

Naturally in building a concrete highway system the matter of expansion joints came up and was considered by the Highway Commission, and this, as is the oft-quoted collision between an irresistible force and an immovable body, is a mighty big subject over which even engineers debate and quarrel, thus excusing an ordinarily intelligent layman from expressing an opinion one way or the other. Suffice it to say that the State Highway Commission has not put in expansion joints and does not, so far as can be discovered intend to do so, preferring to let the concrete crack and make its own expansion joints while on the other hand Stanislaus County put in expansion joints and swears by them and, it may be said, has mighty fine concrete roads while Sonoma County is planning upon doing the same.

This being the proper point to stop discussing road type and technique pause is here made and the reader of technical bent respectfully referred to the reports of the California Highway Commission and the thousand and one volumes on highway construction which are on library shelves.

CHAPTER VI

CONVICT LABOR

In the development of the California State Highway, convict labor has been employed to quite an extent under what is known as the "Convict Labor Law" passed by the Legislature in 1915, which provided that convicts might be employed in the construction and maintenance of the State Highway, this act being passed largely as a result of the activity of Mr. C. F. Stern, then a member of the California Highway Commission and afterwards State Superintendent of Banks.

Such employment was purely voluntary; could only arise as the result of a formal application made to the Prison Board by some convict who desired to win his way back to the world of freedom by hard and continued toil; and, in justice to Mr. Stern, it is only fair to say that, in advocating the law, he was animated more by a desire to help some man who had made a mistake back to paths of honesty than by any coldly commercial benefits which the Highway Commission might perhaps hope to derive.

No money incentive was offered the convict to encourage him to enlist in State Highway work, the only reward accruing to him being a commutation upon his sentence of one day for each two calendar days spent away from prison. Based upon honor, for the convict applicant for State Highway employment was required to give his word of honor that he would labor faithfully and not try to escape, the plan has worked out more or less satisfactorily; it would perhaps have worked out better if control of the "honor men," as they have come to be known, had been centralized in one definite authority, instead of being divided between

the State Prison Board, which was charged with the discipline of the various camps, and the California Highway Commission, which, through its engineers, was made responsible for the work to be done. Under the law, the California Highway Commission was made responsible for all of the expense involved in the establishment and maintenance of these honor camps; transportation of prisoners, food, clothing, medical attention, the salary of the guards who represent the prison authorities, costs of escapes, and rewards for capture being some of the items.

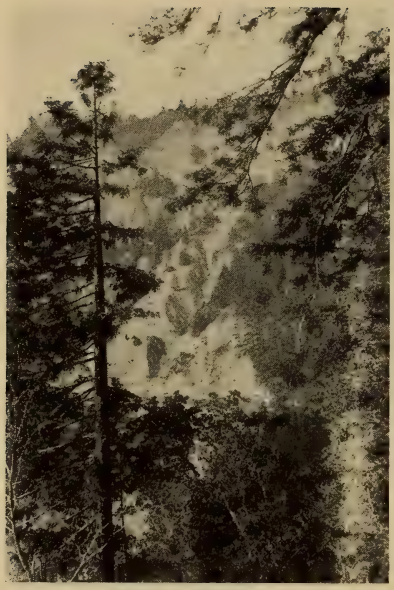
Naturally, at times friction has arisen, the guards representing the State Prison Board contending that they should have something to say about the work, as they are officially in charge of the men, while the engineers of the California Highway Commission, from the fact that their organization was footing the bills, thought that they ought to have something to say about the running of the camp.

In the main, however, these differences have been trivial and soon adjusted, the principal trouble arising from the fact that no man can serve two masters, which was exactly what the honor men were required to do, and so there has been a lack of esprit de corps, if that is the proper phrase when applied to convicts, among these men, who are not so different, after all is said and done, from the rest of us; who did not know where the authority of the Prison Board left off, and that of the State Highway officials began and, not knowing, became involved occasionally in some trivial squabble which had a tendency to lower their morale and make them less effective in and less inclined toward their work.

Just what the solution of the condition described above may be is neither here nor there, but it is to be hoped that some satisfactory operative plan may be arrived at in which centralization of authority will exist and which will tend to encourage that man who has erred into a persistent struggle toward rehabilitation. Perhaps an allotment of money, of a small sum for each honest day's work, to be credited to each individual and paid him in a lump when he has toiled his way to freedom, might have an influence, in that when

Small tractor and scraper operated by "honor" men

A typical convict labor scene on the California Highway system.



Big slide on Rattlesnake Creek.

On Rattlesnake Creek near Eel River.

Hard rock work done by convicts.

On South Fork of Eel River.

his time was served, and his debt to society written off the books, he could face the world with a fair sum of money on hand, and clothes upon his back, that he had bought with money he had labored for, instead of a few pitiful dollars in the pockets of prison hand-me-downs that advertised him as a recently freed convict.

In the matter of accomplishment, however, calculated from a financial standpoint, wherein there is no sentiment, the plan of using convict labor in the development of the California State Highway may well be judged by the data relative thereto in the first biennial report of the California Highway Commission, which treats of the employment of convicts at length, in each of the three divisions where they have been employed.

In Division I where the employment of convict labor began on September 20, 1915, and where the total number of man-days worked amounted, up to December 31, 1918, to 162,458, the cost per man per day figured $2.53 for each day actually engaged in construction work, comprising all costs, even that of rewards for escaped convicts, and tobacco, which is given each man free. Taking into consideration holidays, time spent in other than actual highway work, Sundays, sick days, and days when the weather forced the men to remain inactive in camp, the cost per man per day amounted only to $1.87, so the cost of $2.53 per day for each man actually employed on highway work seems reasonable indeed when the compensation accorded the laborer today is regarded. As to the amount of work done by these men, it may be said that they excavated of solid and loose rock 411,125 cubic yards, and of earth and clay 336,375 cubic yards, a total excavation of 747,500 cubic yards, the expense involved being $500,077.10, an average cost of only sixty-seven cents per cubic yard, which it may be said for the information of the uninitiate is scandalously cheap. In addition to this excavation work, these men constructed culverts, retaining walls, etc., built thirty-six and one-half miles of road in the most rugged place that the State Highway has yet penetrated, at a cost per mile of $15,074.70, overhead expense

and engineering preliminary expense of all sorts and all other incidental costs being figured against the job. To quote Mr. Somner, the engineer of Division I: "The men are housed in tents and frame buildings. The camps are well lighted and heated. The sanitation conforms to the regulations of the Commission of Immigration and Housing, which covers everything conducive to cleanliness, health and comfort, including bathing facilities. The food is wholesome and plentiful, the convict ration not being in evidence. The cooks are selected from the convict labor and their services are satisfactory."

As to the "convict" ration, there are those of us who have sat in the messroom, and broken bread with the convicts, and can testify to huge platters with at least two different kinds of meat that tasted mighty good, and several different vegetables well cooked and appetizing, while a casual visitor peeping in the door if asked to sort out the goats from the sheep might well have been excused for regarding the table where the engineering force and casual guests were gathered as about the most suspicious in the place.

Continuing to quote from Mr. Somner, "the work is being accomplished by means of pick and shovel, and station cars, wheelbarrows, steam shovel, teams and scrapers, and road graders operated by tractors, convict labor being employed in all methods with the exception of the operating crew on the steam shovel. The drilling is accomplished by both hand labor and machine drills. Throughout the entire construction more or less rock has been encountered, and drill and powder have been important factors in the prosecution of the work. The blasting operations have been extremely hazardous, involving the use of two hundred and fifty tons of powder, and the men have displayed a remarkable aptitude for this work, both in caution and efficiency. Only one fatal accident has occurred, for which no one was to blame. The prison labor has during the 'work or fight' period constructed an important link of the State Highway, through an exceptionally rugged and remote country, and under severe climatic conditions, as the work was continuous

through three winter seasons of heavy rainfall. The results, from both humanitarian and economic standpoints, may be considered as being satisfactory, and it can be said that the men from the California State Prison at San Quentin 'did their bit toward winning the war.' "

The work above referred to is that along Rattlesnake Creek and the South Fork of the Eel River, on the San Francisco-Eureka highway, and the accomplishment made by these men speaks for itself—a road in the main hewed out of steep-sided canyons where no trail even existed before their coming, and that opens up to all-year travel a region that in winter has been isolated and remote. It forms a worthy monument to those men who planned the law, as well as to those who profited by it, for in the building of this stretch of road, a few human wrecks have been made seaworthy and sailed out once again upon the sea of life, made buoyant and self-sustaining by the knowledge that they were able to do an honest day of toil.

In Division II, convict labor was employed, starting in July, 1916, when a camp was established in the Yuba River canyon in Sierra County. At first this camp was not a marked success, the dual control spoken of above serving to make conditions unsatisfactory until in March, 1917, when the Highway Commission was put in complete charge. To quote Mr. Bedford, the highway engineer: "Since that time the organization has been so perfected, and the interest of the convict in the work so improved, that now (November, 1918) we are doing the work for one-half of what we would pay a contractor, or about thirty-five cents per cubic yard for earth excavation and fifty to sixty cents for rock. We are building a road twelve feet wide in excavation, and fourteen feet wide in embankment, and all in a rough, rugged, mountainous country where transportation of men and supplies is expensive in summer, and almost out of the question in winter. Enough supplies must be stored in camp by the middle of November to last until the middle of April. Just now the convict camp is a very efficient and money-saving institution. Comparing it with free labor, the convict work-

day costs about $1.50, while free labor costs $4.00 per day, and the convict will do more work than the average free laborer at the present time." In Division III under W. S. Caruthers the experience with convict work has been practically similar to that set forth.

So much for the hard commercial side of utilizing convict labor on State Highway work, and the men quoted in relation thereto cannot be blamed for devoting most of their consideration to the dollar-and-cent side of the subject, for they are employed upon an efficiency basis, and their work is a hard, brass-tacks, cold-blooded business employment, wherein they are required to deliver the goods.

There is, however, another and a softer side to the subject, which renders the experience of the California Highway Commission with convict labor of interest to those soft-pated enough, to believe that there are other things besides dollars and efficiency which are worth while. Some of these convicts, a pitiful few perhaps, after earning their way to freedom by hard and continued toil, have stayed on the job in other camps where every man is free and earned their $4.00 a day, and more, perhaps, saving most of it, and investing it in thrift stamps, and war savings stamps and bonds, giving to the Red Cross, and other war activities, freely, and striving to accumulate a sufficient stake wherewith to make another start in life. Urged by the lure of freedom, a few of them have learned that an honest day's work was possible of accomplishment, and been taught how to use muscles that they scarcely knew they had, with the result that a tiny plant of hope has thrust out roots and grown and flourished, giving them encouragement to work and save, and start forth unafraid upon a journey toward better things than they have ever known.

Experiment it is at its present stage of development, this convict labor upon California highways, yet it is undoubtedly a start toward something better, and if through it some better plan should be evolved whereby prison walls may be avoided by the man who has made a mistake, it is undeniably worth while.

Nothing suggests that these men are convicts. They wear no stripes.

Convict camp in Mendocino County. Visitors' room in the base of large tree.

On the Coast Highway south from San Francisco in San Mateo County.

CHAPTER VII

MAINTENANCE—ROAD LOAD—SAFETY—SIGNING—TREE PLANTING—CAMP SITES

In so far as maintenance of the State Highway is concerned specific legislation has provided funds which, up to the present time, have been fairly adequate, but which, with the enlarged scope of California's State Highway system, will hardly serve to meet the needs of future years. These funds, derived from the state motor-vehicle tax, of which one-half is allotted to the State Highway Commission, the other half going to the different counties in which it was collected, amounted in 1918 to $2,842,638.70, after collection expenses were deducted, the state getting $1,421,319.35, a similar sum being divided among the counties.

Under maintenance in the early part of 1919 the State Highway Commission had approximately one thousand eight hundred miles of paved highway and seven hundred miles of mountain roads, which kept them busy, although it may be said that for the past few years, owing to war-time conditions, the maintenance fund has been used in part in new construction as well as in repairs.

In applying the funds set aside for highway upkeep, maintenance stations have been developed in the various divisions of the State Highway, and from these the road is patrolled by maintenance crews, which are constantly at work keeping the shoulders along the edges of the concrete pavement in repair, patching up worn surfacing, filling up expansion cracks in the concrete, and generally emulating the busy bee in honest endeavor to keep the highways safe and pleasant for travel as well as to see that they are not subjected to abuse.

The abuse of highways, it may be said, is a matter of vital interest, not alone in California but also all over the United States, where paved roads are being built, for no sooner is a paved road laid down for reasonable traffic than some individual appears with an excessively large truck, burdened with an excessively heavy load, and proceeds to do his best to break it down.

This class of individual, fortunately few in numbers but unfortunately to be found in every walk of life, views selfish, personal interest as a matter of paramount importance and regards legislative restrictions as things to be honored in the breach rather than in the observance, when they interfere with him.

To restrain him and to supply corrective measures, an arbitrary road load has been fixed by the statutes of California, which provide that the maximum weight to be imposed upon the State Highway shall not exceed eight hundred pounds per inch of width of tire when such tires are of other material than metal, not more than six hundred pounds per inch of width of tire being allowed on metal tires, permitting a load approximating a gross weight of twelve and one-half tons for a five-ton truck with capacity load.

In all conscience this load would seem to be sufficient to satisfy any man who uses the State Highway, yet there are those who no sooner find themselves supplied with a type of road which affords them a medium for commercially profitable enterprise than they proceed to misuse it by putting out loads of twenty tons and upward.

In so far as the use of California's highways by farm machinery is concerned regulatory statutes exist which require that a written permission from the Highway Commission be had before the roads are used, this permission being granted under certain restrictions which provide for the banding of or removal of knife-blade edges on the front wheel of tractors and the equipment of other machinery with devices intended to protect the road, the main problem which confronts the California Highway Commission being the creation of a proper force of patrolmen, which, owing

On Ridge Route in Los Angeles County. Guard rails sometimes save careless drivers.

Concrete curb, in addition to preventing roadside wash, supplies a measure of safety.

Altamont Pass, leading from San Joaquin Valley to Oakland. The main entry way into San Francisco from the Sacramento and San Joaquin valleys. This picture shows in detail the safety element supplied by guard rails.

to the lack of funds, it has not in the past been able to organize.

Provision for the safety of the traveling public has been an ever-present thought in the general plan of California highway development, every effort having been made to provide fool-proof roads for careless or reckless drivers. On mountain grades, at dangerous curves, and along banks in the straight-away where the element of danger is present in even slight degree, stout, white-painted guardrails have been and are to be more freely installed.

These guardrails are of substantial construction, not strong enough of course to withstand the impact of a heavy car driven at a high rate of speed, but, none the less, they supply a sense of safety, serve the purpose for which they were created, of protecting and safeguarding the careful driver, and even, upon occasion, keeping a reckless driver from a thousand-foot pitch down a mountain side.

The concrete curbs mentioned in a preceding chapter also supply an additional factor of safety in that they protect against wet-weather skid in places where danger exists for any machine which leaves the road, as does the custom of cutting off hill points where blind curves exist, a range of vision being afforded by this practice which enables the traveler to see an approaching vehicle and permits him to regulate his conduct accordingly. The most important step taken by the California Highway Commission in safeguarding travel, however, deals with the elimination of railroad grade crossings, the original surveys of the State Highway being made with this object in view, and that success has attended the commission's efforts goes without saying, in Division II alone more than fifty of these danger spots having been supplanted by rerouting the road and the construction of overhead passages or subways, the cost of construction being borne jointly by the Highway Commission and the railroad company, and sometimes the county in interest has joined in, the State Railroad Commission being the controlling body which permitted or ordered the improvement, as the case might be.

In extension of this work a squabble resulted from the plan adopted of putting in "skew" subways, wherever possible, to avoid a right-angle road turn, the Railroad Commission holding that a right-angle crossing would serve the purpose just as well from the standpoint of the railroad company, the "skew" crossing being primarily a convenience for the traveling public, establishing the rule that the railroad company and the state should each pay one-half of the cost of right-angle subways, while for "skew" subways one-quarter was to be charged against the railroad and three-quarters against the state.

The matter of road signing forms a comparatively small part of the work of the State Highway Commission, which, while having jurisdiction of the right of way, has been relieved by California's two splendid automobile clubs, which have voluntarily assumed the burden of putting up distance, direction, and warning signs.

In that portion of the state north of an imaginary line drawn from the ocean at the northern boundary of San Luis Obispo County, thence to the east slope of the Sierras, where it trends sharply east of north to the Nevada line, the California State Automobile Association, with headquarters at San Francisco, has forty-five of the fifty-eight counties of the state within its jurisdiction, these being Alameda, Alpine, Amador, Butte, Calaveras, Colusa, Contra Costa, Del Norte, El Dorado, Fresno, Glenn, Humboldt, Kings, Lake, Lassen, Madera, Marin, Mariposa, Mendocino, Merced, Modoc, Monterey, Napa, Nevada, Placer, Plumas, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Shasta, Sierra, Siskiyou, Solano, Sonoma, Stanislaus, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba.

In these counties the traveler, upon both the State Highway and county roads, finds neat yellow-enameled metal signs set upon iron posts to direct him to his destination, as well as to warn him of dangers. In many places also, historical spots are marked.

The officers of this club for 1919 are H. R. Basford, presi-

This picture of American River Bridge at Sacramento illustrates work done by California State Automobile Association in signing historical places. Mistletoe on trees in background.

Warning sign at entrance to Colorado Desert east of El Centro on San Diego-Yuma State Highway route. Example of signing done by Automobile Club of Southern California.

dent, San Francisco; John W. Stetson, first vice-president, Oakland; George S. Forderer, second vice-president, San Francisco; John R. Graham, third vice-president, Merced.

The directors are, in addition to the officers already mentioned, L. A. Nares, Fresno; Percy E. Towne, San Francisco; Edwin F. Merry, San Francisco; P. J. Walker, Oakland; M. H. de Young, San Francisco; D. H. Lafferty, Santa Rosa; Burton A. Towne, Lodi; Frank A. Cressey, Jr., Modesto; Milton Esberg, San Francisco; S. O. Walker, Visalia; Charles B. Bills, Sacramento; Francis Carr, Redding; Dr. E. W. Westphal, San Francisco; W. S. Clayton, San Jose; Elmer McKinnon, Salinas; George A. Campbell, Reno, Nevada; the treasurer being Edwin F. Merry of San Francisco, with D. E. Watkins as salaried manager.

Affiliated with the American Automobile Association the California State Automobile Association has taken an active part in road development in California, has campaigned actively for the three State Highway bond issues, has been responsible for much legislation dealing with the use of public highways, and maintains a Good Roads Bureau, which has conducted ten successful county highway bond elections, aggregating more than fifteen million dollars, spoiled an otherwise good batting average by losing one, and has on hand a number of similar undertakings.

The services of this bureau are supplied free to any county seeking the improvement of its highways, and an equipment probably superior to that maintained by any other good roads organization, consisting of moving pictures, a portable stereopticon outfit, bales of publicity material, and road statistics of every kind, is placed at the disposal of any county without cost.

In southern California, where it might as well be admitted road improvement has outstripped all other sections of the state, the Automobile Club of Southern California has spent much money in highway legislation, development, and the proper signing of roads, taking part also in campaigning for the three State Highway bond issues.

This club, a much older organization than the other, is an

institution of which southern Californians are justly proud and has within its jurisdiction the counties of Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, Tulare, Ventura, and Imperial.

Although these counties are far fewer in number than those within the jurisdiction of the California State Automobile Association, some of them make up in size the lack of quantity, San Bernardino County being about equal in size to all the New England States.

Throughout the jurisdiction of the Automobile Club of Southern California an impressive road development has taken place, not equaled perhaps in any similar area in the world, for one of the principal assets of this section is a tourist travel that seems always to have reached its height yet continues in ever-increasing flow.

With a splendid road development already achieved, the Automobile Club of Southern California is none the less continually at work on highway betterment, under the direction of Fred L. Baker, president; W. L. Balentine, first vice-president; Horace G. Miller, second vice-president; Standish L. Mitchell, secretary; the board of directors being composed of A. C. Balch, H. W. Keller, Frank P. Flint, E. T. Off, and Edward D. Lyman, as well as the men named. Working with the board of directors is an advisory board consisting of Frank J. Belcher, Jr., San Diego; T. B. Fuller, Imperial; W. L. Benchley, Orange; John H. Fisher, San Bernardino; Frank A. Miller, Riverside; C. A. Barlow, Kern; C. D. Hubbard, Santa Barbara; Ben Maddox, Tulare; Chas. Donlin, Ventura; Dr. W. M. Stover, San Luis Obispo; H. J. Nichols, Pomona; and by these two bodies much highway improvement has been accomplished, much road signing done and service rendered to automobile owners similar to that offered by the other club.

Tree planting along highways, particularly in desert sections, is part of the plan of the California Highway Commission, and this phase of its work has already been started on that stretch of road south of Bakersfield on the valley

On the Highway south from San Francisco. Highway tree planting started fifty years ago

Highway tree planting in San Mateo County.

route where for seventeen miles the concrete pavement is absolutely without a hairbreadth deviation from a straight line. This section is in practical entirety treeless desert, subjected to a blaze of sun when the summer is on the valleys, but alongside the right of way trees have been planted and are growing, a ten-mile pipe line furnishing the water to keep them thriving, and it is only a matter of a few years when shade will be supplied.

In the development of its plan for tree planting the California Highway Commission is working in conjunction with State Forester Homans for the establishment of a tree nursery where young trees may be planted and cared for until they are ready for roadside planting.

In taking up this phase of highway development the California Highway Commission is but following in the footsteps of others, for nearly forty years ago John McLaren, now the Superintendent of Golden Gate Park in San Francisco, planted the trees which flank in stately rows the State Highway in San Mateo County leading south from San Francisco, while in other localities similar highway improvement has been done.

In the Southern California section tree planting and highway beautification has reached an impressive development, palm lined avenues existing in many places. Leafy tunnels formed by the willow like pepper trees are to be found in others, while avenues flanked by stately eucalyptus trees are so common as scarcely to attract any attention.

In the more remote sections of the State Highway, where the road leads through the mountains or along the sides of canyons where rivers flow, the division engineers of the State Highway are being encouraged to develop camping sites easily accessible—here a cool and refreshing spring where overhanging foliage makes an attractive stopping place, there a flat beside some brawling river where riffles sing of the trout that lurk in the still water back of rocks. Another place perhaps attracts where giant redwoods lift their trunks like the pillars of some vast cathedral. The oceanside, may be the choice of some where a sandy, far-flung beach invites

the passer-by to pause and listen to the breakers or join with them in play. All these are possibilities which the future holds in promise as highway development in California now made certain is advanced, and while we Californians, native born or immigrants from Missouri or Arkansas, if you please, are justly proud of our present road development, we are careful to assure the world that we have just begun.

CHAPTER VIII

THE VARIOUS HIGHWAY COMMISSIONERS AND OFFICE PERSONNEL

In the development of the California State Highway system various situations, and vastly puzzling ones at that, have from time to time arisen and are still arising, involving problems of psychology rather than of engineering, requiring the attention of diplomats rather than of engineers.

To deal with these problems has been and still is the function of the California Highway Commission, which seems always to have been able to keep work going on in spite of difficulties. At the very start they found it necessary to call upon Boards of Supervisors to eke out inadequate funds by supplying rights of way and bridges, and these much-abused bodies of men, whose portion in life seems to be brickbats instead of bouquets, responded gladly, bought rights of way, built bridges, and in some instances even built roads, and presented them to the Highway Commission, so that it may be said and in justice should be said that the California State Highway system is not only a monument to the men who built it but to the Boards of Supervisors of California as well.

The first Commission, appointed by Governor Johnson, was made up of Burton A. Towne, Lodi, chairman; Charles D. Blaney, Saratoga; and N. D. Darlington, Los Angeles; and these men, making bricks without straw, initiated the work of building the State Highway and served through the most trying period of its history. Upon the three men constituting this Commission rested the responsibility of selecting that type of pavement which would best meet with the requirements of the law as to permanency. They chose the concrete base, and time has justified their choice. To

get money they were dependent upon the sale of bonds, which could not legally be sold for less than par and could not commercially be sold at par. They called upon their friends the Boards of Supervisors and these men bought the bonds.

So they practiced high finance and got the work started, sent survey parties out and generally got busy, with the result that Chairman Burton A. Towne started work on the first State Highway concrete paving job in California near San Mateo on August 7, 1912, since which time something like fifteen hundred miles of concrete pavement has been laid.

On January 19, 1914, Mr. Towne, finding that he must devote some time to his own personal affairs, resigned, and Charles F. Stern, of Eureka, was named to succeed him, Mr. Blaney being elected chairman. Just what connection Charles D. Blaney had with the California Highway Commission every good-roads enthusiast in California knows; and, while many of them had pitched battles with him over this matter or that, they invariably wound up by developing for him a sincere affection as a man and a great respect for him as a fighter for what he thought was right.

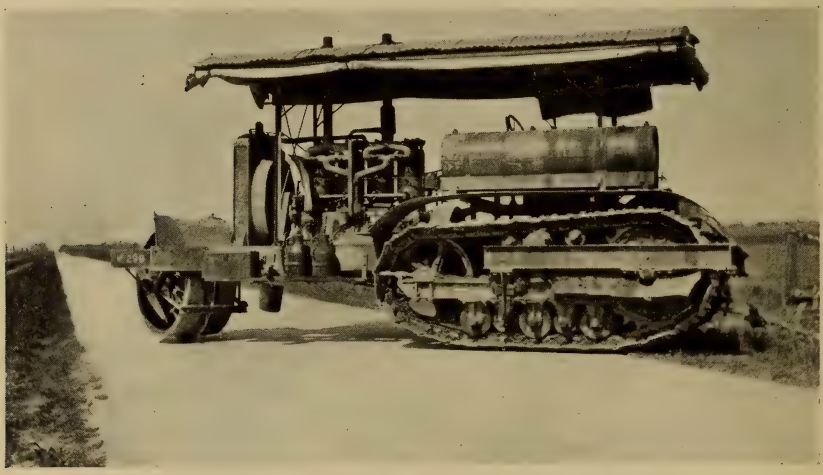
Mr. Blaney resigned from the Commission on March 6, 1917, because he had overworked himself with State Highway affairs to such an extent as to jeopardize his health; and Henry J. Widenmann, of Vallejo, was named to take his place, while Mr. Darlington was elected chairman.

Mr. Widenmann's connection with the Commission was all too brief, yet while he served he played his part well and creditably, having a host of personal friends throughout the state whose interest he was able to enlist in State Highway affairs; and when he died, in October, 1918, as the result of an accident while hunting, he was widely mourned.

To succeed Mr. Widenmann, Mr. Charles E. Whitmore, of Visalia, was named, and shortly after his appointment, Mr. Stern resigned, having been appointed State Superintendent of Banks by Governor Stephens. In his connection with the Commission the policy of employing convicts upon State Highway work was adopted, he being largely responsible for securing the needed legislation.

The Builders of California's State Highway in 1914: Left to right, R. H. Stalnaker, C. C. Carlton, S. V. Cortelyou, W. Lewis Clark, T. E. Stanton, R. K. West, W. C. McClure, State Engineer; Austin B. Fletcher, F. G. Somner, Charles F. Stern, J. B. Woodson, F. W. Haselwood, E. B. Osborn, N. D. Darlington, S. S. Stahl, Charles D. Blaney, W. S. Caruthers, George B. Harrison, A. B. Cleveland, W. R. Ellis, R. E. Dodge, A. E. Loder, J. H. Small, W. C. Howe. Sitting, left to right, George R. Winslow, H. L. Warren, T. A. Bedford, George Mattis.

State Highway in Kern County.



Abuse of State Highway.

Upon the retirement of Mr. Stern, Emmett Phillips, of Sacramento, was appointed on December 30, 1918, and during his brief connection with the Highway Commission took an active part in the development of the $40,000,000 bond issue, but died in June, 1919, before the bond issue was passed.

To Mr. Phillips' place Governor Stephens appointed Mr. George C. Mansfield, of Oroville, the Commission at the end of 1919 being made up of Mr. Darlington as chairman, Mr. Whitmore, and Mr. Mansfield, with Wilson R. Ellis as secretary, the present chairman having been a member of the original Commission of 1911 and having served through various vicissitudes until at last sufficient funds have been provided for completion of that work which eight years ago scarcely seemed more than a dream.

The experience thus gained by Mr. Darlington well fits him to pilot State Highway affairs through the prosperous years that now befall the Commission, and having been an anchor to windward in time of stress and storm, he is amply competent to preside when big undertakings are to follow in the train of ample funds.

To say that the troubles of the California Highway Commission are over is far from true, and just as much diplomacy is required of it today as formerly; yet, with funds sufficient to prosecute the work with reasonable diligence, the main burden is lightened, and all that the commission needs to do to be happy is to build everybody's road first.

Messrs. Whitmore and Mansfield, being newspaper men, are schooled in trouble and also versed, it may be said, in diplomatic undertakings, and with the experience gained by Mr. Darlington in his long service to guide it, the California Highway Commission of 1920 will face its best year and make marked progress toward that time when every main avenue of travel in California shall be a paved highway.

In the achievement of this to-be-desired time certain engineering undertakings of course have been and will be necessary, and to this end Mr. Fletcher, the highway engineer, has surrounded himself with a headquarters organi-

zation of no mean caliber, his principal helper being George R. Winslow, whose title, somewhat imposing, is First Assistant Highway Engineer. In every big organization there is always some one individual whose duty it is to deal with points of law, and this duty rests upon C. C. Carlton, attorney for the Commission, who devotes his entire time to State Highway work.

The assistant engineers in the headquarters office are, at the end of 1919, R. H. Stalnaker and William J. Gough, the office engineer being A. J. Wagner, while Ralph E. Dodge is the engineer having charge of all State Highway bridgework, the engineer in charge of testing and other laboratory work being Fred T. Maddocks. The assistant secretary and disbursing officer is Mrs. H. M. Davidson, the chief accountant being Herman B. Weaver, and the purchasing agent being Lowell B. Smith, through whose hands all the multiplicity of detail involved in the procuring of supplies must pass. In charge of the photographic department, map photography, etc., is E. M. Muse, and the fact that a great majority of this force has served since the organization of the headquarters office speaks well both of their loyalty and efficiency and makes certain that whenever an accounting may be called for and efficiency investigated a strict summing up of stewardship will be promptly rendered in detail.

CHAPTER IX

DIVISION I—THE ELIMINATION OF THE BELL SPRINGS GRADE.

THIS subdivision of the State Highway with headquarters at Willits, Mendocino County, comprises the coast counties of Mendocino, Humboldt, and Del Norte and the inland county of Lake.

It extends from the north line of Sonoma County, ninety miles north of San Francisco County, to the Oregon line. In topography this division is mountainous, although a myriad of little valleys with as rich soil as exists any place in California are to be found, the copious and never failing winter rainfall making the entire area susceptible of agricultural development while fruits of various kinds grow with marked degree of perfection upon the deep-soiled side hills.

Immediately upon the organization of the State Highway Commission, Mr. F. G. Somner was put in charge of this Division, as Division Engineer, and from that time has been continuously in charge. It may be also said that he has been kept busy emulating the parable of the "Loaves and Fishes" trying to build a maximum road mileage with a minimum of money, hampered in his work by isolation from source of supply as well as by the topographical nature of the county which was characterized by hillsides prone to slide under the heavy winter rains.

Until 1914, when the line of the Northwestern Pacific Railway was extended to Eureka in Humboldt County, Mendocino County was the only one of the three to have rail communication with the outside world, Willits being the northern terminus of this road.

From this point the journey to Eureka, which in 1914 had a population of fifteen thousand, being one of California's

principal coast towns and one of the greatest lumber-manufacturing centers on the Pacific Coast, was something of ill repute in summer when only dust had to be contended with, but in winter, when the ample rainfall of the region was pouring down and snow piled up on the higher reaches of the road it was something to be avoided at all cost.

There was, of course, an alternative route by steamer from San Francisco, but this trip, over sadly rough waters and a notoriously evil bar before which steamers lay hove to for hours and even days sometimes, waiting a chance to cross in, made those upon whom unkind nature had imposed a susceptibility to seasickness choose the lesser evil of the horse-drawn stage, which traveled, when it was able to travel at all, upon the following winter schedule:

First day. From Willits, leaving about noon by logging train to Sherwood, thence by stage to Laytonville.

Second day. Laytonville to Harris.

Third day. Harris to Blocksburg.

Fourth day. Blocksburg to Carlotta.

Fifth day. Carlotta to Eureka by logging train.

In making this trip the journey carried the traveler over the widely known and vastly infamous Bell Springs Grade, the beginning of which, on the south slope, was at Cummings on what was known as the Rattlesnake grade, where the elevation was one thousand three hundred fifteen feet above sea level. From this point ascending and descending grades, many of them exceeding twenty per cent, lifted the road up two thousand seven hundred eighty-five feet to the twelve-mile distant summit where an altitude of four thousand one hundred feet was reached.

Arriving at the top and enthused by the view, the novice might suppose his troubles were over, but such was far from being the case, for the down grade to Dyerville, forty-six miles distant, involved a drop of three thousand nine hundred thirty-eight feet during which the twenty per cent grades of the south slope were rendered cheap and unimportant by ascending and descending grades up to thirty per cent—almost one foot in three!

In the Mendocino Redwoods. Division Engineer Somner.

A rerouting of this State Highway line eliminated two grade crossings. Old road to right.

The Scotia bridge across Eel River on the State Highway. Humboldt County helped pay for this bridge.

Another view of Scotia bridge. Note the automobile on right span and angler below.

For more than twenty years, prior to the creation of the California State Highway Commission, the elimination of the Bell Springs grade had been talked of and considered and even, at one time, the point was reached when a co-operative county plan was seriously discussed. But when a reconnaissance was made and the cost of the undertaking stated brutally in terms of dollars and cents the plan was promptly dropped for the reason that neither of the counties interested wished to go bankrupt with the job half done.

To discuss the Willits-Eureka stage trip in winter is perhaps not strictly within the sphere of this book, but there are those among us who have a recollection of two, sometimes four, steaming horses dragging an empty stage up some of the most abrupt pitches of the route, encouraged by a driver who conversed with his flock, using those time-honored flowers of eloquence with which a beneficent nature seems to endow stage drivers and Mississippi River steamboat mates as reported by Mark Twain, while, behind, a sad assemblage toiled slowly on and upward, lifting with each step and taking with them what mud desired to go along, and only failing to raise up a chorus to the chanting of the driver because they needed all the breath they had for purposes of locomotion.

Such was the Bell Springs grade prior to 1914, and when the division engineer had need to go to Eureka in the early stages of his work when the road, in the language of those conversant with conditions, was "kind of sticky," which meant that it couldn't be traveled at all, he used to proceed north by taking the train due south from Willits to San Francisco, one hundred thirty-nine miles distant, and thence by a two-hundred-fifty-mile boat voyage complete his trip, a total journey of about four hundred miles to get to a place distant only about one hundred forty-five miles from his starting point.

The elimination of this grade and the laying out of a road built upon engineering lines was the principal job which Mr. Somner, the engineer put in charge of Division I, found in his office when he assumed charge, and the route he

selected, which now is entirely graded and open for travel except as now and then a sliding hillside over the roadway lets go and comes down, blocking travel for a little while, departs from the old road at Cummings where the weary climb over the Bell Springs grade began.

From Cummings, where, as has been stated, the elevation is one thousand three hundred fifteen feet, the new road drops on a gradual grade, which in no place exceeds six per cent, to Dyerville, 70.4 miles distant, where the elevation is one hundred sixty-two feet, the route selected by Mr. Somner leading down Rattlesnake Creek to its junction with the south fork of the Eel River, and thence along the Eel River to where it pours its waters into the Pacific Ocean, near Loleta, but a short distance to the south of Eureka.

Sounding simple enough in the telling, the construction of the road between Cummings and Dyerville was the big job of Division I and when Mr. Somner started out on those preliminary reconnoiterings which finally wound up in the selection of the route, he found that those mountain-goat qualities with which all good mountain-road building engineers seem to be endowed came in very handy, for a good part of the route led through a sheer canyon where a slip or a misstep meant a long fall into none too placid waters, not to mention an unavoidable association with the inhabitants of Rattlesnake Creek, whence it derives its name.

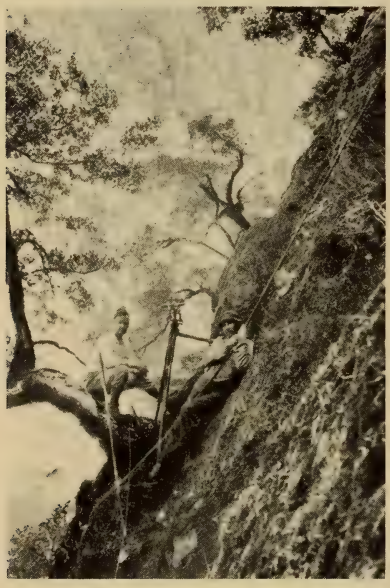
Along this creek, to its junction with the south fork, the canyon was straight-sided, and along the south fork a similar condition prevailed, only more so, the canyon walls being vastly higher, but somehow or other the preliminary view was made and the route adopted, whereupon those cog-wheels of highway building known as transit men, rod men, and chainmen, all of them being second cousins to the chamois, sallied forth, and, clinging to hillsides that would seem to afford a basis of operations for nothing less sure-footed than a fly, ran their lines, set their stakes, and joyfully proceeded to whoop up their part of the job.

To add to the joys incidental to the construction of this stretch of the road it may be said that the canyon sides

Concrete bridge over Eel River built by Humboldt County.

Along Klamath River.

Along Eel River.



Government Engineers.

State Highway Engineers.

were mostly "slidy" and that when the bench-like roadbed was hacked out of the mountain side the hill above, in many instances, let go all holds and slid down, blotting out the road completely. During the first two winters, after this stretch of road was carved out of the canyon side, more than three hundred thousand cubic yards of earth came down, which means, a cubic yard of earth containing twenty-seven cubic feet, that a mass of earth nine feet wide and nine feet high and a tiny fraction less than nineteen miles long had to be cleaned out before it could be said to be once more a road.

Aside from the difficulties of construction involved in building down the Rattlesnake and Eel, the matter of bridges was perhaps of next importance, among them Cedar Creek bridge, three hundred fifty feet in length, one hundred thirty-five feet in height; Rock Creek bridge, two hundred ten feet long and one hundred forty-five feet high; and two crossings of the South Fork, each three hundred fifty feet long.

The remoteness of the locality and the absence of any method of transportation made steel bridges an impossibility while vast redwood forests close at hand supplied plenty of lumber, so it was that a sawmill was dragged in and set up with vast labor and timber bridges built, one of them, the Rock Creek bridge, a timber arch of unique design being erected without the use of any false work and the only structure of its type in the United States.

That there were and are other engineering difficulties existent in this division goes without saying, but none of them stands shoulder high with those involved in the elimination of the Bell Springs grade, and now that this particularly tough job is done, most of the going is easy except in that part of the line from Eureka north along the Trinidad Coast to Crescent City.

This work has been surveyed, and it may be said that Mr. Somner once again enjoyed the pleasures of mountain engineering when making the reconnaissance through Del Norte County. For miles and miles the location runs along the rugged ocean shore where precipitous mountains tumble steeply into the waves, and upon one memorable occasion,

when, with a companion he was clambering along the precipitous bluff on water level, the rising tide left but one way out and that up. Unable to hear each other because of a driving rainstorm and roaring breakers, or to see each other because of the night which had come down they became separated and for twenty-four hours the world knew them not, during which brief period of time Mr. Somner climbed, according to his best recollections, about forty miles straight up in the air.

In the section named, along the coast north of Eureka, reaching to Crescent City, the county seat of Del Norte County, the survey has been made and construction work is under way in parts, the same condition existing in relation to the lateral into Lakeport over the Free Road grade which, while not presenting any particularly vivid engineering difficulties, has none the less been delayed until in the fall of 1919 when all contracts for this 19.5 mile stretch of road have been let.

Without the work in Del Norte County, or that involved in the Lakeport lateral, the division engineer of this division has had about all the troubles he wanted in building a passable highway into Eureka, the main center of population in his district, and when this is done, he will be free, save in those harassing periods when adjacent hills slide down into the road, to engage himself with those engineering joys which await him along the extreme northern coast of California, and to apply himself diligently to supplying the people of Del Norte County with what they have longed for, a real road, not to mention the people of Lake County, who after years of waiting have acquired a stock of patience which would make Job ashamed, and still hope, happily with some reason now that work has actually started, for a three-hundred-sixty-five-day road leading to the outer world.

In Yuba River Canyon on Downieville lateral in Sierra County.

State Highway through Dunsmuir. Office of Division II on right.

In the canyon of the Sacramento River. (Before.)

In the canyon of the Sacramento River. (After.)

CHAPTER X

DIVISION II—BUILDING THE STATE HIGHWAY UP THE SACRAMENTO RIVER CANYON.

THIS division of the California State Highway is situated in the extreme northern and eastern part of the state and takes in the counties of Trinity, Tehama, Shasta, Siskiyou, Lassen, and Modoc. In its southern central portion is the upper end of the Sacramento Valley, which narrows in just above Redding and attenuates into a rugged gorge down which the waters of the Sacramento River pour. To the east and north and west of this valley are mountains amply rugged enough in character to test the soul of any road-building engineer, yet road development in this district, in so far as the main trunk line is concerned, is well advanced.

The man in charge of this division is Mr. T. A. Bedford, whose headquarters are at Dunsmuir and who, it may be said, prefers mountain road-building, with its tinge of adventure, to the more prosaic and less laborious construction of concrete roads upon the flat.

The main job which Mr. Bedford found before him when he assumed charge of this division involved the construction of a link in that great valley line which, originating near San Diego on the Mexican border, climbs over the Tehachapi Mountains, traces its way through the vast flat of the San Joaquin and Sacramento valleys, and finally sweeps triumphantly over the Siskiyous into Oregon; no particular difficulties presenting themselves in the upper part of the Sacramento Valley, which terminates at Redding, the county seat of Shasta County.

From this point, however, all of the varied joys of mountain road-building were offered Mr. Bedford, and when he

started out on a reconnaissance of the country, preparatory to putting survey parties in the field, he went mostly afoot, climbing up to the top of a high mountain now and then, to get a bird's-eye view of the country, clambering like a fly along abrupt walls where the swift waters of the Sacramento River had channeled through the rock, and eventually selecting a line which led due north to the east of the Sacramento Canyon, crossed the Pit River near its junction with the McCloud, and followed the latter gorgeous trout water up to a place where a climb over an easy graded saddle in the mountains enabled him to reach the canyon of the Sacramento at a location where road-building was a financial—as well as a human—possibility.

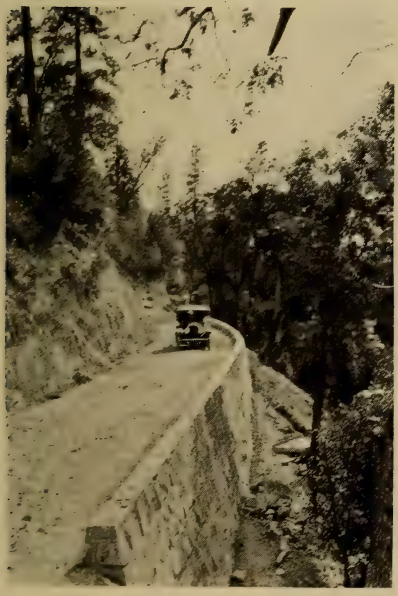
In laying out this line up the McCloud it may be said that Mr. Bedford pioneered the way through primeval places, not even a trail existing, and when he swung his line to the west and entered into the Sacramento Canyon he spanned the river and the main line tracks of the Southern Pacific Railway with one structure, the plan of eliminating railroad grade crossings being one of his most pronounced engineering hobbies.

The fact that the new line from Redding to Oregon has done away with fifty of these danger spots suggests that Mr. Bedford has stuck to his hobby, no matter how it bucked.

From the point where the new road reached the Sacramento River, no particular difficulties such as would intimidate a man who liked to build roads in the mountains appeared: the line adopted leading up the west wall of the canyon, now hanging high above the tracks of the Southern Pacific; now above some sheer drop into the river which the railroad company, having ample funds at its disposal, had avoided by a bridge. The only fly in the ointment was that the railroad had got in first, preempted all the easy going, built a water-grade roadbed and forced the State Highway up on to a hillside so steep in places that occasionally, when some enthusiastic and not overcareful contractor put an extra bit of powder in a "shot," two or three carloads of boulders would arise and fly down on to the railroad right

Klamath River bridge.

Bridge over Sacramento River.



Rock wall protection on Pit River.

Division Engineer Bedford.

Mount Shasta on the Valley line of the State Highway.

of way, contrary to the peace and dignity of the State of California, which didn't care particularly, and to the great mental perturbation of the United States Railroad Commission, which did care, and arose and injuncted the guilty parties from similar felonious acts.

At any rate Mr. Bedford had a lot of fun building the road up through the Sacramento Canyon, as much fun perhaps as any automobile owner will ever have in driving over it, even though it is scenically gorgeous and under the 1919 State Highway bond issue is to be paved with concrete to the Oregon line.

The northern terminus of this particular stretch, which involved the canyon of the Sacramento River, may properly be regarded as Dunsmuir; the line from this point climbing to a great upland plateau boxed in by mountains on all sides, the south wall being made up of Black Butte and Mount Shasta, with the Sierra Nevadas to the east, the Coast Range to the west, and the Siskiyous rising like a barrier on the north.

Over this plateau, in sight of the snow-capped peak of Shasta for miles and miles, road-building was an easy matter, comparatively, to Yreka, county seat of Siskiyou County, where the farthest north concrete street in California leads the highway through the town. From Yreka, near which place the roadway drops into the canyon of the Shasta River, Mr. Bedford once more enjoyed some sure enough road-building; getting down to the level of the Klamath River through a country that was virgin save for jack rabbits and occasional rattlesnakes being no inconsiderable job.

In reconnoitering this stretch of road Mr. Bedford, who seems by nature inclined to be a mountaineer, found a conveniently adjacent hill which towered above all other eminences around and scaled it, finding that the view disclosed a feasible road location throughout the entire length of the Shasta Canyon to its juncture with the Klamath, at which point the man ordained to cast a fly with profit to himself may fish.

From the Klamath River to the Oregon line the main

construction problem was a climb up the south slope of the Siskiyous which involved heavy grading, in some places figuring up to $20,000 a mile, this road being graded and open to travel in 1918, further perfected in 1919 and supplied with sufficient funds, under the $40,000,000 State Highway bond issue of 1919, for concrete paving throughout.

From this main line, which constitutes the principal road in Division II, various laterals spread out to east and west; on the west being the Trinity lateral which reaches Weaverville, the county seat of Trinity County, passing en route the old-time mining town of Shasta, and extends to the Coast Highway at a point north of Eureka; the construction of this road being a joint affair, with the state, Trinity and Humboldt Counties and the United States each contributing to the general jack pot. No particular difficulties, that do not everywhere attach to mountain road-building, exist in this locality and this road, under construction in 1919, will supply a needed access to the coast from upper Sacramento Valley points. South of the Trinity lateral is the Peanut Road already built, a state road supplied to connect two counties neither of which had funds to do the job, this road, with the road systems of Trinity and Humboldt Counties reaching Eureka by an alternative route. To the north of the Trinity lateral a new road, proposed under the 1919 bond issue, leaves the main trunk line at the Klamath River, follows the gorge of this tumbling stream to the westward and to the south through the Klamath National Forest, affording unexpected joys both to Mr. Bedford's force and to the engineers of the United States Forest Service; a good part of the reconnaissance work being made by canoes with which, in the main, good luck sailed, other parts of the preliminary investigating necessary involving flywise progress along the face of sheer uplifting walls.

The expense of this road is shared jointly by the State and Government and during those preliminary undertakings, which involved deciding upon the layout of roads to be taken care of under California's 1919 bond issue, governmental red tape was for once fractured to the amazement of

Overhead railroad crossing near Mount Shasta. Black Butte in background.

Bridge over Pit River near its junction with the McCloud, north of Redding.

all beholders and Government engineers for once took a hand in the general wire pulling, being forced into this unseemly attitude, perhaps, by the fact that certain existent Government funds have been set aside to build this road if the state would contribute an equal sum.

At any rate this road is to be built, and preliminary reconnaissance work has been done. In general, the way lies along the canyon of the Klamath River, in most instances the country through which the line passes is straight up and down and there is scarcely any doubt that Mr. Bedford views with undiluted pleasure another mountain road-building job. True enough the job is only partly his, the young men of the engineering department of the Forest Service having canoed and climbed throughout the entire canyon, yet morally certain is it that Mr. Bedford will be on the spot when work begins and will undoubtedly keep an eye on the general road-building scheme.

To the east of the main trunk line in Division II are two county seat laterals, the one reaching from Redding to Alturas in Modoc County, the other to Susanville in Lassen County, leaving the main line at Red Bluff. Neither of these roads involves any particular difficulty other than that comprehended in getting sufficient funds, which, happily, has ceased to be an issue. In the past, however, this fortunate condition did not prevail and while much good work has been done the main grief which existed was involved in the fact that Division II, with about the biggest road mileage of any division, was the Lazarus at the rich man's door and about all it got so far as cash is concerned was crumbs.

Both the Alturas lateral and the Susanville lateral are important, reaching into a country that is remote, sparsely settled, possessing scarcely any county road funds, and almost entirely dependent for connection with the outside world upon the State Highway. Both of these laterals reach altitudes where snow falls in winter, the one to the north of Lassen Peak, the other almost at its very base to the south, and in their development the only road con-

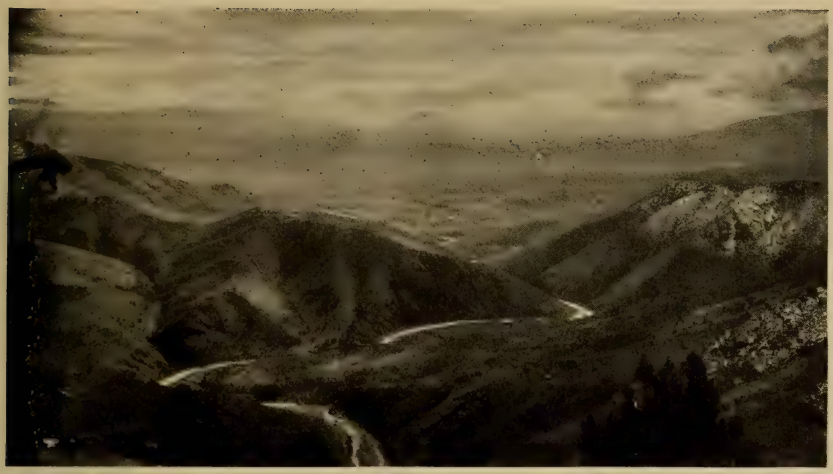
struction contemplated is such as will supply engineering grades, permanent bridges, and culverts, in short a modern mountain highway of safe width and wide-swung curves over which pleasure travel can flow safely and the resident of the district can gain access to the outside world.

In addition to the counties formally allotted to his district, Mr. Bedford has been placed, temporarily, in charge of certain road-building operations in Butte County, where the Plumas County lateral leading to Quincy, the county seat, originates at Oroville, and in Nevada and Yuba Counties, through which the Sierra County lateral reaching Downieville passes.

Both these laterals involve mountain road-building problems. Both of them are situated in remote localities, and both of them are being built under the direction of Mr. Bedford, who is having no end of fun with them, in the summer of 1919, even though they are properly within the jurisdiction of Mr. W. S. Caruthers, engineer of Division III.

In the road work already done in his division, Mr. Bedford has pursued a practice that should endear him to the man who considers a camp outfit a proper adjunct for an automobile trip. Whenever possible, he has dropped a side road down to some pleasant camping spot, here to a little flat along some brawling trout stream, there to a nook underneath high-lifting pines, and in another place to some ice-cold spring.

Without any particular sanction of the commission, which being made up of business men applies its funds according to the strict letter of the law, the men who work for and with Mr. Bedford, in the noon hour, perhaps, or when a few spare moments appeared, have spent a little time in work not strictly within their line of duty and made accessible to travelers many an attractive spot.



This photograph of Shasta Canyon was made during preliminary survey.

State Highway down canyon of Shasta River.

State Highway in Yreka, Siskiyou County. The farthest north concrete pavement in California.

CHAPTER XI

DIVISION III—THE BUILDING OF THE SACRAMENTO-YOLO CAUSEWAY

This division of the State Highway is, in 1919, and has been since its establishment, in charge of Mr. W. S. Caruthers as division engineer. It takes in the counties of Glenn, Butte, Colusa, Yolo, Solano, San Joaquin, Stanislaus, Tuolumne, Calaveras, Amador, El Dorado, Placer, Alpine, Nevada, Sierra, Plumas, Yuba, Sutter, and Sacramento, its headquarters being in Sacramento.

Within its boundaries is practically all of that region of California where gold was produced in the days of '49, where much mountain road-building is yet to be done and wherein are situated some of the most popular outing places in the state. It has, in the past, been hampered by lack of funds, as have all the other divisions of the State Highway, and in the road work which has been done attention was devoted, in the main, to the development of highways in those valley sections wherein were links of main lines of travel or where such a traffic congestion existed as to demand the construction of paved roads. Throughout the length of Division III from north to south, the main highway forms a link in the valley route from Mexico to Oregon, this link being paved by different counties in places when the State Highway came into being and the roads thus existent being made to serve as long as possible. In its reach north from Sacramento, this main trunk line lay on the east side of the Sacramento River to the Tehama County line, another main trunk highway trending up the west side of the Sacramento River and forming a direct route by way of the Sacramento Valley from San Francisco to Oregon, the two routes joining

a few miles to the north of the Tehama County line in Division II.

Between the east and west side lines, especially in the vicinity of Sacramento, was a vast area of lowlands through which the overflow waters of the Sacramento, the Yuba, the American, the Feather, and the Bear rivers poured when the piled-up snows of the Sierras ran off in spring and early summer, and for years, from the days when Marshall discovered gold up until 1916, Sacramento, the capital of California, was as isolated from the west side of the Sacramento River, save for a few months each year, as though it were two hundred miles away.

Correcting this condition was Mr. Caruthers' big job, a job well and creditably done now and which constitutes one of the engineering accomplishments of the California Highway Commission. And where once was a place impossible of crossing, a great marshy district three miles wide by 120 miles long and flooded for all but a few months of each year, now is a three-mile trestle over which traffic flows to and fro day in, day out, in spite of floods.

In the old days—and these days were prior to 1910, not so long ago—the crossing of this overflow district was a dream that seemed a far way off. Even in 1913 a trip over the State Highway from Sacramento to San Francisco involved a circuitous route of 130 miles by way of Stockton. In a bulletin published by the California Highway Commission under date of May 1, 1913, this interesting statement appears: "There is now no crossing across the Sacramento River north of Sacramento, except for about three months in the fall of the year, until one reaches Meridian Ferry, a point about 18 miles west of Marysville. One must travel not less than 70 miles from Sacramento to reach that ferry.

"Thus communication by wagon road between the rapidly growing and prosperous sections on the west side of the Sacramento River in Yolo, Colusa, and Glenn Counties with Sacramento, the capital of the state, is to all intents and purposes cut off.

"From Sacramento to Davis is about 12.8 miles, but the

cost of bridging the great Yolo Basin which receives the overflow of the Sacramento River, has heretofore prevented the construction of this important road.

"During the coming year the Commission hopes to let contracts for the construction of this link. Not less than 12,000 feet of trestle work will be required and there will be much heavy grading required.

"When this link is completed, not only will the west side counties be able to reach the state capital conveniently, but the distance between Sacramento and San Francisco will be reduced from 130 to about 100 miles."

In contemplating this statement of the California Highway Commission it is interesting to look back once again to the Bureau of Highways of '95 and '96 with the wonderful road plan they laid out, for on the map they drew up after the trip through the state with the buckboard and old Maje, mentioned in Chapter II, is this selfsame road plan,a crossing of the overflow area to the north and west of Sacramento, now regarded by the present Highway Commission as one of its most important accomplishments. Across this overflow area, prior to 1913 and for how many years previous no one knows, for a few months each year, when the waters had subsided from the face of the earth and the rich adobe soil had dried out under the sun, there was a way known as Tule Jake's road, a concatenation of ruts and bumps and general discomfort that led through the cat-tails and was always rough because traveled over when the adobe was drying out. Perhaps Tule Jake was a contemporary of the Bureau of Highways, for its map shows a crossing of the Yolo Basin just about where the road is today. At any rate with this major problem in his division Mr. Caruthers addressed himself to it; the plans for its solution were drawn up in the offices of the California Highway Commission and on March 18, 1916, travel flowed over a trestle, built of precast concrete piling upon which were set precast concrete slabs forming a roadway 21 feet wide in the clear, with concrete curbing and stout iron guard-rail. This road was 16,538 feet in length, 2432 feet of the total length being of

timber construction for the reason that some day a levee to define the westerly margin of the Yolo By-pass is to supply a banked-up road.

To deal with the technical details of this great accomplishment is not within the purpose of this book, yet it is interesting to know that the reinforced concrete piles upon which it rests are from 32 to 50 feet long; that they were cast at one spot and transported to the needed point by a specially built narrow-gauge railway and that they are driven into the ground to an average depth of 20 feet. Nearly 1100 carloads of material were used in the work, including 21,692 tons of crushed rock, 12,553 tons of sand, 32,000 barrels of cement, and 2200 tons of reinforcing steel; the total cost of the trestle being $394,000, while under present prices it would cost $1,000,000 at the very least.

To end this discussion of the Yolo-Sacramento Causeway without giving credit to Yolo County for the part it played therein would not be just. This county, under the law which provided that interest charges upon State Highway funds expended in any county must be met by the county in which such funds were spent, gladly assumed the heavy burden which resulted therefrom, although the work was beneficial to the state at large rather than locally; and it is pleasant to relate that this attitude has been appreciated and that Yolo County has been reimbursed by statute for past funds supplied and relieved from any future charge.

In addition to the Yolo-Sacramento Causeway, Mr. Caruthers found a lot of other things to do in his division, for that matter, is still finding them. Under the 1919 State Highway bond issue a new and very important cross-state road, the Tahoe-to-Ukiah highway, was confided to his care, and, inasmuch as this road is the pet project of a very active and enthusiastic crowd of good-roads boosters whose sole purpose in life is to have it completed instanter and at once, he will, no doubt, have his hands full. In addition to this road, a road from Truckee, in part down the Truckee River, that most blessed of trout streams, to the Nevada line near Verdi, is also pleasantly engaging his attention. The fact

Above Placerville on the Sacramento-Lake Tahoe Highway in El Dorado County.

Inspecting method of ponding concrete roads. Left to right—Senator Moser of Oregon. Division Engineer Caruthers, Office Engineer Dodge, G. Cameron Parker, Dominion of Canada Department of Highways.

State Highway in Colusa County.

that he has 19 counties in his division, each of which must, by law, have its county seat connected with the main trunk line of the State Highway, tends to keep him well supplied with work for some time in the future, as does the further fact that within his division lie some of the most popular touring trips in California, where automobile travel reaches a huge volume in summer and plays havoc with the only type of road which, so far, he has been able to build.

Taken all in all, there are no vastly harassing jobs facing Mr. Caruthers now since the overflow area of the Sacramento River has been bridged, and throughout most of that section of his district which lies in the valley proper, concrete highways are almost 100 per cent put in.

In the mountainous parts of his territory, however, much road work is to be done; that ever-lengthening ribbon of concrete which goes to make up the extent of the California State Highway system must be pushed out here and there; his tourist roads must be paved, where tourist travel gathers in heavy volume, as toward Lake Tahoe both over the Placerville route and by way of Auburn and Truckee; and there is no danger that he will lack for work for some time to come.

Also the tearing up of oil macadam roads, which open-hearted counties gave the State Highway, will further serve to hold him for a while, his burdens being lightened somewhat by the fact that Mr. Bedford, engineer of Division II, is being accorded the privilege by the Highway Commission of doing some work in Butte, Yuba, Sierra, and Nevada counties, which involves highway construction in part through canyons where a Rocky Mountain goat would have to exercise due diligence and caution if it desired to live to a ripe old age.

In the main, however, Mr. Caruthers' troubles are practically over, and it may be said that in 1919, save for the high cost of labor and materials, the difficulties incident to doing work by convict labor, and the troubles his prehistoric oil macadam boulevards are giving him, he is enjoying life to its full extent.

CHAPTER XII

DIVISION IV—THE BOULEVARD AROUND SAN FRANCISCO AND SAN PABLO BAYS

When this division of the California State Highway was established, Mr. A. E. Loder was placed in charge as division engineer, his jurisdiction extending over the counties of San Francisco, San Mateo, Santa Cruz, Santa Clara, Alameda, Contra Costa, Napa, Sonoma, and Marin.

In other words, the area around San Francisco Bay for about 75 miles to north and east and south, was given to him, with all of the responsibilities thereunto appertaining or belonging; the fact that his district comprised the most populous section of the state making the situation unenviable for him as he, like every other one of the division engineers, was expected to build roads when funds therefor were utterly inadequate; the need for roads in his district being emphasized by the volume of traffic centered therein. However, the fact that practically all of the counties immediately adjacent to San Francisco had built roads served to lighten the gloom somewhat and Mr. Loder, exercising good business judgment and under the sanction of his commission, appropriated what roads he needed as a nucleus, thereafter, on August 7, 1912, with pomp and ceremony starting actual construction work on the California State Highway system in San Mateo County.

In facing the work involved in developing the system provided for by law in Division IV, it may be said in all fairness to Mr. Loder that no startling or spectacular pieces of engineering work fell to his lot, the Santa Cruz lateral from the main line at San Jose being merely a climb over a not particularly difficult mountain, the connection between

The State Highway on the bluffs of Contra Costa County above Carquinez Straits.

This picture shows in detail the poured curbs used in State Highway work. Corrugated pipe spillway carries off water, preventing bank erosion.

Oakland and Martinez being only a side hill job dealing with a troublesome, slidy hillside and no other pieces of work being worthy of comparison with, for instance, the Bell Springs grade in Division I.

So it might be assumed that Mr. Loder was destined for a peaceful tenure of a desirable office, with a fairly well developed road system already put in by the various counties serving as a basis for further work, the main difficulty apparent at first glance being to extend this system along State Highway lines with as little traffic trouble as possible on finances that might truly be said to be inadequate even for the necessary work.

However, before Mr. Loder had long been permitted to conduct the affairs of his office in peace and quiet an entirely unexpected development arose, involving the building of what will some day be one of the most popular drives around any city in the United States. This drive, starting at San Francisco and, at San Jose, swinging around the lower end of San Francisco Bay, passes through the peaceful orchards of the Santa Clara Valley, turns to the north past Mission San Jose, through Oakland and Berkeley and thence trends along the bay shore heights of Contra Costa; crossing the Straits of Carquinez at Martinez to Benicia. From this latter place by way of Cordelia and through Jameson Canyon into the beauties of the Napa Valley and on through the lower reaches of Sonoma, Jack London's Valley of the Moon, the proposed road leads, past pleasant places in Marin County, under the shadows of Mount Tamalpais to where, at Sausalito, a ferry trip across the Golden Gate completes the way.

In sight of mountains and bay for almost its entire length it was so simple in its engineering problems as to be almost child's play. There were, however, difficulties to be overcome, financial ones involving the raising of $175,000 of additional funds to supplement the existing allotment of State Highway money; and to this task, under the active backing of Mr. Charles D. Blaney, chairman of the commission, Mr. Loder addressed himself.

The sum required could only be derived from pure dona-

tions contributed by Napa, Sonoma, and Marin Counties. The stretch of highway to the west of Napa not being a part of the State Highway system, no funds were provided for its construction, the entire plan being to fill in a gap in what was purely a scenic route. In the plan was involved the building of a huge bascule bridge across Petaluma Creek, a navigable stream which bore much tonnage under the fostering care of the Government.

This route between Napa and Ignacio came in time to be known as the Black Point Cut-off—it crosses the lower Sonoma Marsh in sight of the point of that name—and, promised for completion by the summer of 1915 when the Panama-Pacific Exposition was to bring all the world to California, may possibly be completely paved with concrete before the end of 1920.

So Mr. Loder started out to raise a mere bagatelle of $175,000, the man responsible for his endeavors being Mr. Charles D. Blaney, chairman, at the time, of the California Highway Commission, an intense individual who plunged with Rooseveltian enthusiasm into any favored project and hung onto it with the tenacity of Fate.

At any rate Mr. Loder started out, equipped, it may be said, with fully as much enthusiasm as Mr. Blaney, and was ably assisted by his principal assistant engineer, Mr. R. K. West. And for ways that were dark and tricks that were vain Bret Harte's heathen Chinee was a mere tyro compared to these two. They were, it may be said, captained by an individual destined to lead in desperate undertakings, one who had sold State Highway bonds at par when State Highway bonds were not selling for par upon the stock exchange and who needed only the spur of difficulty to develop amazing powers.

In the apportionment of this $175,000 Napa County was accorded the inestimable privilege of putting up $65,000, Sonoma County $75,000, while Marin County, being small and weak, was allowed to escape with $35,000. In addition to these sums, all rights of way and bridges over 20 feet in length were to be taken care of by the interested county, so

it may be seen that the money needed was a goodly sum. In so far as Napa County was concerned, Napa, St. Helena, and Calistoga got back of the project through their respective Chambers of Commerce, attending to those difficult negotiations which finally resulted in the Board of Supervisors, at that time made up of Bismarck Bruck, chairman; Frank Alexander, S. J. Webber, Jasper Partrick, and Charles Wassum, providing for the needed sum by a tax increase.

In Sonoma County, one valiant spirit, Dr. E. L. Paramore of Boyes Springs, led all the way; while in Marin County a generally concerted movement of all the different promotion bodies was started by M. F. Cochrane, whose vocabulary knew no such word as "fail." And so it was that the movement was attended with success and the great bascule bridge across Petaluma Creek made possible, an undertaking which, upon its inception, seemed as impossible of accomplishment as the materialization of the genie from the bottle.

With the main difficulty disposed of, a start was made at once toward securing the necessary rights of way and just at this time Mr. Loder was called back to Washington, where he was appointed one of the principal assistants in the United States Bureau of Public Roads under Logan Waller Page, and Mr. W. Lewis Clark, the engineer of Division VII, whose previous undertakings will be found dwelt upon in Chapter 15, was transferred to the vacancy thus created.

Whereupon evil days befell, arising from all Europe going to war and finally embroiling the United States. Labor was hard to get and high-priced. Cars for the movement of material were interdicted by this commission or that. Yet work proceeded and, Mr. Loder having finished the financial major part and brought to practical completion the minor construction details of the Black Point Cut-off, Mr. Clark undertook and graded and paved that part of the Round-the-Bay Boulevard which lies in Contra Costa County, on the hills above Carquinez Straits and Suisun Bay, and constitutes what is probably the crookedest stretch of road in all California, a road that will rank well up with the scenic roads of the world in time to come.

In addition to this stretch of road completed by Mr. Clark, another worth-while endeavor awaits him in the construction of what is known as the San Francisco "Skyline Boulevard," a road-building undertaking that supplies an additional outlet to the south from San Francisco; this road being much needed to relieve a traffic congestion on the already established road to San Mateo and San Jose, where 20,000 machines passing over the road, by actual count, on a fair Sunday make up a volume of traffic that renders touring unpleasant if not unsafe. This particular "Skyline Boulevard"—there are a baker's dozen in the state—follows the crest of the Coast Range mountains, bay on one side and ocean on the other, to a junction with the already constructed San Jose lateral to Santa Cruz, affording with the established roads of San Mateo, Santa Clara, Santa Cruz and San Francisco counties an extension of the purely touring road system of central California which matches well the notable achievements of the south and will, in time, form a link in a road reaching along the ocean shore from San Francisco to the Mexican line.

One feature embodied in the proposed plan pleases—the fact that money enough is at hand to do the job—for under the $40,000,000 bond issue voted in 1919 sufficient funds have been provided to push to completion, with all speed, those things which should have been but have not been done, as well as those things which, under California's latest road bond issue, have been deemed worth while; the fact that the counties interested have formed a highway district to push the Skyline Boulevard along making assurance doubly sure.

On the Santa Cruz lateral of the State Highway, showing concrete curbing.

Guard rails in Division IV, and Division Engineer W. Lewis Clark.

San Juan grade on State Highway. The first climb south from San Francisco on the Coast Route

CHAPTER XIII

DIVISION V.—THE SAN JUAN MOUNTAIN AND ZACA CANYON CONTROVERSIES.

THIS division of the California State Highway takes in the coast counties of Monterey, San Luis Obispo, and Santa Barbara and the inland county of San Benito is generally rugged in character, lying as it does wholly within the Coast Range mountains, and comprehends some of the most attractive scenery in the state.

The man placed in charge of this division when it was created was Mr. Walter W. Howe, and the principal job allotted to him was the building of a link in the main coast line highway between San Francisco and Los Angeles from the Santa Clara County line on the north to the Ventura County line on the south, an engineering job that required entirely new surveys in many instances where existing roads had been built without much attention to the percentage of grades.

Shortly after Mr. Howe took charge of this division and almost immediately when he had filed with the California Highway Commission his recommendation as to route, two sizable fusses in widely separated districts arose at one and the same time, one involving his recommendation for the establishment of a line over San Juan Mountain in San Benito and Monterey counties; the other over the routing between Santa Maria and Gaviota in Santa Barbara County, where he had recommended a line down through Zaca Canyon, contrary to the peace of mind of several Santa Barbara County towns, each of which aspired to be on the main line but, under Mr. Howe's routing, was left off.

In relation to the controversy which arose over the San

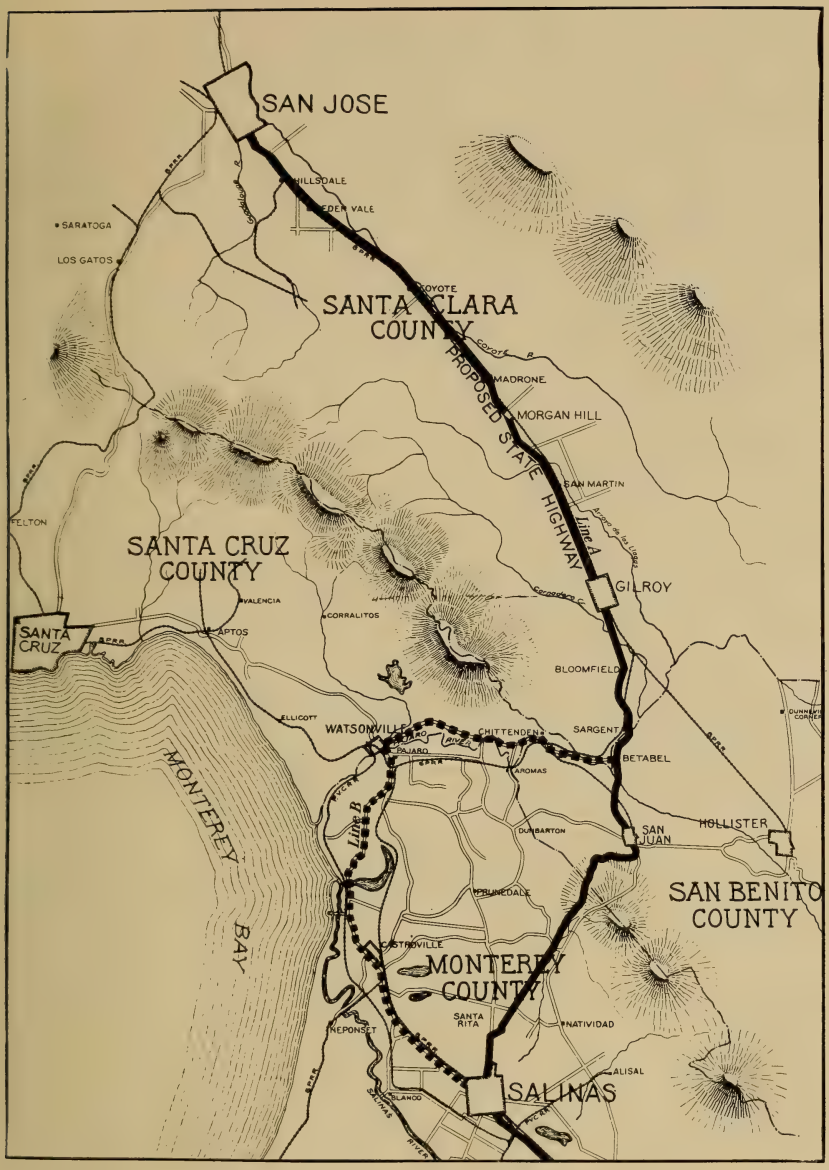
Juan Mountain routing it may be said that it was largely started by the people of Watsonville, in Santa Cruz County, who felt that their thriving city should be considered; and while the arguments presented by them were given courteous attention by the California Highway Commission, that body formally decided against them and recommended in favor of the San Juan route, for the following dignified and categorical reasons:

"*First.* Because the San Juan route is the most direct and practicable route between the lower end of the Santa Clara Valley and Salinas, the county seat of Monterey County, it being at least fifteen miles shorter than the opponent's line via Watsonville. Salinas is on the natural line for travel.

Second. The town of Hollister, county seat of San Benito County, must be connected with the trunk line. This lateral, seven miles in length, can be constructed at least cost by tying it to the commission's line at San Juan and at the greatest advantage to Hollister and San Benito County. If the State Highway passed through Watsonville the connecting lateral would be eleven miles long. Hollister is a county seat and Watsonville is not.

Third. Notwithstanding the miserable road now existing over San Juan Mountain most of the travel follows that route because of its directness. The road planned by the commission will have only one mile of six per cent grade, the balance varying from two to four per cent. The road proposed via Watsonville passes along the bank of the Pajaro River for some distance. The road there is menaced constantly by a bad "slide" resulting from a "fault" in the strata of the hill on one side and by the river on the other, which erodes the bank to such an extent that piles and bulkheads have been placed to prevent it. The road here has been destroyed more than once from these cause."

Saying which, the commission started Mr. Howe out to build over the San Juan grade, which he did, supplying a comfortable and scenic way, whereupon the people of Watsonville decided that if the mountain wouldn't come to Moses, Moses would go to the mountain and immediately resolved



Solid line shows completed highway over San Juan grade in Division V. Note direct route, solid line, as opposed to dotted line, wanted by Santa Cruz and Monterey counties.

Solid line shows present State Highway route which continues along the Coast through Gaviota and Orella. The dotted lines show various routes which formed the basis for a sizable dispute.

that sooner or later they would have a paved highway in the exact location decried by the State authorities; and this highway will be completed some time in 1920 under the bond issue passed by Santa Cruz County in June, 1919, the tie-up from the Santa Cruz County line to the State Highway in San Benito, a distance of about three miles, being paid for by the California Highway Commission, which tends to show that, in spite of the dignified denial they accorded the Watsonville folk, their respective hearts are in the right place.

With regard to the Zaca Canyon controversy half a dozen Santa Barbara County towns figured as protestants while, to the contrary notwithstanding, the California Highway Commission adopted the Zaca Canyon line, giving the following reasons:

"*First.* It is the most direct and practicable route between Harris and the Gaviota Pass. It is not the shortest, being about four miles longer than the shortest route through the mountain passes, but the adopted line will have but two and one-half miles of grade in excess of five per cent while the shortest line (Line D on the accompanying map) would have seven and one-half miles in excess of five per cent. Line B was the second choice of the commission and only after much debate was it discarded.

Second. This location enables the town of Lompoc to make a connection with the State Highway more easily than it could with the Los Olivos-Alisal line (Line B) and reasonably well satisfies the desires of that town. The lateral will follow the Santa Ynez River by easy grades.

Third. The presence of good local material for road construction and the delivery of materials from the railroads to Zaca Station, the downhill haul and easy grades, will greatly lessen the cost of the work as compared with any other route.

Fourth. A dangerous grade crossing about one mile west of Los Olivos will be obviated, as will also a twelve per cent grade in the same locality. The adoption of the commission's route entails the construction of a bridge about one thousand feet in length over the Santa Ynez River. On the Los Olivos-Alisal line over the same river there is now a bridge of about

the same span and of the type known as "combination wood and steel." This bridge will last but a few years and the new bridge on the Zaca route will take its place. The bridge question should not control when better alignment, better grades, and four and one-half miles saving in distance may be secured by the route proposed by the commission."

The cases cited are intended to illustrate the difficulties faced by the California Highway Commission and its engineer in developing a State Highway plan; and in making these decisions, as well as a thousand and one others of similar character throughout the state, it is worth while to quote the questions they asked themselves and answered, which are as follows:

"*First.* Are directness and practicability the main factors?

Second. Or, on the contrary, is the placing of a county seat or county seats on a trunk line, even at the expense of a number of additional miles, the primary consideration?

Third. Shall the route of a trunk line be deflected, even though considerable distance is added, in order to connect the present center or centers of population numbering from a few hundred to a few thousand people?

Fourth. Shall the plan of routing the entire system be based upon the needs of the state as a whole and its relation to neighboring states, or shall the emphasis be placed upon the local needs of the counties traversed?"

These questions are of interest to those men throughout the United States now engaged in the building of State Highway systems, and the manner in which the California Highway Commission answered them establishes a dignified and worthy precedent. Be that as it may, Mr. Howe proceeded to build over San Juan Mountain and down through Zaca Canyon, doing an entirely creditable job, just for good measure abandoning the established road over Cuesta Pass in San Luis Obispo County, between San Luis Obispo and Santa Margarita, and substituting therefor that stretch of highway now popularly known as the Cuesta Grade to be seen in splendid panorama from the coast line trains of the Southern Pacific Railway just after they have essayed the

State Highway bridge near San Luis Obispo, showing flood during construction.

Same bridge as above completed.

The north approach to the Cuesta grade on the Coast Highway in San Luis Obispo County.

famous horseshoe curve north of San Luis Obispo and have burrowed through something like half a dozen tunnels in the climb to the top of the pass.

That there were other troubles existent in Division V may be made plain by stating that numberless arroyos or deep gulches drop down from the Coast Range mountains to the sea; and in bridging these arroyos Mr. Howe found pleasant and engaging work, finding also that Santa Barbara County was ready and willing to lighten his labor by raising some hundreds of thousands of dollars and donating it, in bridge construction, to the State Highway.

With his job well along in progress Mr. Howe yielded to the call of his country in the summer of 1918 and entered the army, formally resigning from the service of the state, his place as engineer in charge of Division V being filled by L. H. Gibson, one of the assistant highway engineers, since which time Mr. Gibson has been pleasantly occupied, suffering slightly from a dearth of finances, it is true, until the 1919 bond issue but otherwise doing the best he could to fill up unconstructed gaps, which he has now succeeded in doing in practical entirety.

That he has a lot of work on hand goes without saying, for the Coalinga lateral from Fresno County to the coast line in Monterey County near San Lucas must be built, as well as the Cholame lateral, which connects the valley line from a point in Kern County north of Bakersfield with the Coast line at Paso Robles in San Luis Obispo County, both of these laterals being comprehended in the 1916 State Highway bond issue.

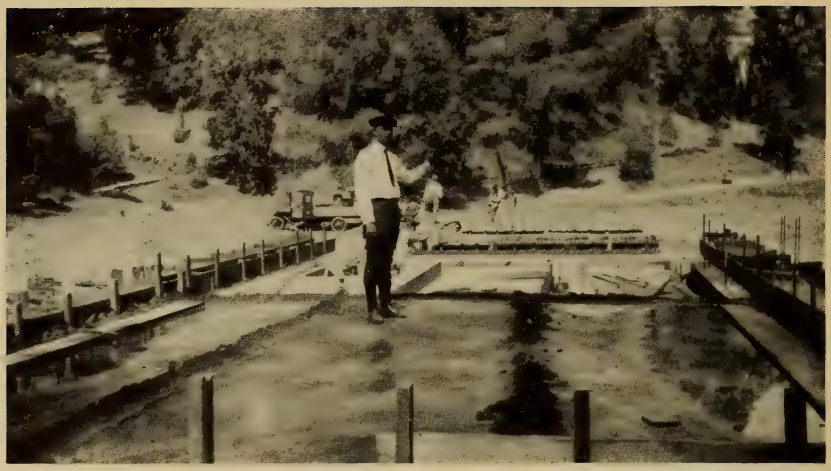
In addition to these jobs, which are far from being inconsiderable in size, under the 1919 bond issue Mr. Gibson had two other roads given to him, the construction of which is going to be a sizable job. The first of these roads is the Carmel-San Simeon stretch from Carmel, in Monterey County, to San Simeon, in San Luis Obispo County, largely through the Monterey National Forest, and intended to supply a link in that coast highway which will some time undoubtedly stretch from the Oregon line to Mexico.

The country through which this proposed road will run is so rugged in character as to try out the climbing qualities of a Rocky Mountain goat, but of glorious scenic attraction, and in major part the proposed route leads through the Monterey National Forest, Government funds being supplied to help in construction work. It is to be a shore line road hung high above the breakers and is intended purely for a touring road, not to be paved with concrete under present plans, merely to be graded with permanent bridges and culverts and easy grades to be supplied which sounds simple enough in the telling but in reality is a whale of a job.

The other new road given this division is the Cuyama lateral and it, also, supplies Mr. Gibson with food for thought, connecting Santa Maria, in Santa Barbara County with Bakersfield, in Kern County, and opening a new route from the interior to the coast.

That the work in this division was well advanced by Mr. Howe and is being well carried on by Mr. Gibson is proven by the fact that it is practically all paved and complete in the fall of 1919 and traveled by thousands of automobile tourists, who know that the grades are easy, the curves wide, and the scenery inspiring, without even realizing that it did not merely grow, like Topsy, but had to be planned for and fought for and labored over, as all other worth-while things are.

The Cuesta grade on the State Highway Coast route north of San Luis Obispo.



Engineer J. B. Woodson of Division VI inspecting bridge work.

Railroad vs. Highway. Picture made in Merced County.

CHAPTER XIV

DIVISION VI—THE NORTHERN PART OF THE TEJON-CASTAIC RIDGE ROUTE

The big job of this division, which has been in charge of J. B. Woodson, division engineer, since its organization, involved the building of a road over the Tehachapi Mountains, which form the south wall of the San Joaquin Valley, to connect with a road to be put in under the direction of the engineer of Division VII; who at that time was W. Lewis Clark, now in charge of Division IV; and those who have driven over the famous Tejon-Castaic Ridge route in touring California will have not the slightest difficulty in concluding that Messrs. Clark and Woodson had many extended confabs on their joint troubles.

In Mr. Woodson's division the State Highway route of unquestionably the greatest importance was that supplying a link in the valley highway from the Stanislaus County line on the north to the Los Angeles County line on the south, about one and one-half miles south of Lebec in Kern County, and for the most part this link was just plain every-day road building through a country that with the application of water has bloomed forth into tremendous agricultural production, which without water would support only jack rabbits and scraggly cactus. So, for the main part of the way, all Mr. Woodson had to do was to build a hard road through a sandy country, now and then essaying a stretch of adobe soil just for a bit of variety, and his problems, until he started building south of Bakersfield, did not supply any unusual amount of grief. From Bakersfield to the south, however, was a different story, for, while there was a road between Bakersfield and the foot of Tejon Pass, this road

passed through about five miles of the worst adobe soil that can be imagined. It was so bad that a strong horse could not drag a light buggy through it after a rain, and it was no uncommon thing in winter to see here and there a cow mired down waiting for a team of horses to come and drag her out.

This old road ran south from Bakersfield by way of Adobe Station and Rose Station, being to the eastward of the present line, and passed through a great adobe flat, virtually a swamp, which extended to the east and west for so many miles that a detour around it would involve a prohibitive expense. So there was nothing for Mr. Woodson to do but to make a road across the adobe, and over this adobe flat the State Highway leads today. In tackling the job before them the highway engineers picked out a place where the swamp narrowed in with a sort of hour-glass effect and started in to build a grade above the overflow level, the section passed through now and then filling up with back waters from Buena Vista reservoir and making an embankment necessary to keep the road above occasional floods.

The construction of an embankment is not necessarily a grave task under ordinary conditions, but Mr. Woodson did not find ordinary conditions. In fact, he found conditions that were distinctly not ordinary. The local material, consisting of adobe and alkali in strong mixture, was not fit, so far as human intelligence has yet discovered, for building an embankment that would last, or for any other purpose, it might be said. So the material for building the bank had to be brought in, and it was brought in, not, owing to certain aquatic conditions which obtain in swamps, by teams of horses and wagons or even motor trucks, but by a specially constructed railroad which occasionally got into trouble and lost a length or two of track as the result of unstable soil and seepage water, otherwise mud.

The line determined upon, over which for several years travel has been flowing in comfort and safety, cut off three and three-fourths miles of distance between Bakersfield and the foot of Tejon Pass in comparison with the Adobe Station road, departed from all existing lines of travel, and

required the securing of an entirely new right of way, which, it may be said, the Kern County Board of Supervisors provided joyously, having had, perhaps, more or less gluey experiences with the old road. For seventeen miles the highway in the stretch under consideration forms an absolutely straight line, the longest stretch of similar character in the state system of roads, to which is added another straightaway of twelve and one-half miles south from Bakersfield, the two combining to make a twenty-nine and one-half mile stretch of road reaching from Bakersfield to the foot of the Tejon Pass with only one slight curve.

While this job of road building was in progress the location of a road over the mountains served to engage the attention of Division Engineer Woodson pleasantly, and when he started seriously to investigate he found that an old-time stage road from Bakersfield to the south had essayed Tejon Pass by way of Grapevine Canyon and reached the town of Lang in Los Angeles County, passing through San Francisquita Canyon en route.

This old road meandered idly to and fro with fourteen per cent grades and crossings over Grapevine Creek every few minutes, this creek being noted for the rapidity with which it could move its bed under the influence of cloudbursts common to the locality, incidentally taking along boulders as big as a switchman's shanty, uprooting aged and respectable oak trees, and generally supplying a state of affairs which made the State Highway engineers sit up and take notice.

So the surveying parties started out and selected a route that lay well up on the hillside, holding in view as paramount to every other consideration that economy which was born from the knowledge that they had a big job to do and mighty little money to do it with.

In selecting this line they kept as closely as possible to the old road, utilizing it where it was upon apparently solid hillside benches, providing for concrete culverts over creek crossings, and finally developing a routing that seemed to be sane and safe according to the best information obtainable.

Then in March, 1914, Grapevine Creek behaved in a manner that cast into the shade all previous misbehavior, and not only wiped out the old road in practical entirety but also encroached upon the new line in such a manner as to prevent its use in the present and to render unadvisable any highway construction upon the lines which, before the cloudburst, had seemed practically safe.

Another and further survey of the section was had and the determination arrived at that not only must the new line be farther up the hillsides, or what was left of them, but also that Grapevine Creek must be controlled, this latter task being taken care of by building solid rock retaining walls alongside the highway wherever it was close to the creek.

These walls were put in, huge boulders being set far down below the stream bed and built up six to eight feet along the slope, which method of control has served to the present time to curb the creek in its uprisings, although now and then it acts in its accustomed manner and turns, almost in the twinkling of an eye, from a trickling rivulet to a roaring mountain torrent which carries all before it and subsides as quickly as it rose.

Where the old road had many steep grades and sharp pitches of twelve and fourteen per cent the new road has a maximum grade of six per cent, easily climbed "in high" by any automobile and safe and comfortable to travel even when the snow, upon rare occasion, blankets the higher reaches toward Lebec.

From one and one-half miles beyond Lebec to Los Angeles, the route lay in Division VII of the State Highway, and in Chapter XV a glimpse may be had of the joys that fell to the share of Division Engineer Clark, whose job it was to begin where Mr. Woodson left off and build a mile-saving road that would connect the vast reaches of the San Joaquin and Sacramento valleys with the wonderland of paved highways lying south of the Tehachapi.

That the engineers of the two divisions succeeded goes without saying, and the Tejon-Castaic Ridge route today, to

Where traffic justifies the mountain roads are paved with concrete.

Wide roadways in the mountains form part of the "safety" plans of the California Highway Commission.

be completely concreted by the fall of 1919, cuts off sixty miles of the distance by the old route between Bakersfield and Los Angeles and enables automobile stages to make better time between the points named than the train.

In the course of the work of laying out the State Highway line south from Bakersfield the intense heat of the treeless desert region was impressed upon the engineers, which resulted in a determination to secure an extra width of right of way for the purpose of planting shade trees, and these trees now have been planted and about fifteen miles of pipe line put in through the coöperation of Kern County for irrigating purposes.

While the growing of trees in a desert country is a fair-sized job all by itself, the plans of the California Highway Commission in relation to this stretch of road look forward to that time when, from Bakersfield south into the cool depths of Tejon Canyon, a double row of shade trees will flank the highway and make a leafy shelter for the traveler, relieving also the vast monotony of driving over a thirty-mile stretch of road that is straight as the flight of a crow save for one little kink, a monotony made doubly oppressive by the blaze of the summer desert sun.

Other undertakings from time to time, of course, have engaged and are engaging the attention of the road-building engineers detailed to Division VI, the building of a road passable all the year round into Yosemite, an extension of the Mariposa lateral, being one of these which has provided no inconsiderable job.

This road into Yosemite leaves the main trunk line of the highway at Merced, and is already graded up to Mormon Bar, from which place short pitches and excessive grades obtain by existing routes which lead over summits where snow piles up in winter and blocks all travel.

The new route selected turns abruptly to the north at Mormon Bar, passes through the long-slumbering mining town of Mariposa, which has sat a bit aside from the beaten path for years, and where, even now, the winter rains occasionally wash gold nuggets out from the dirt of the

unpaved streets. Passing through Mariposa the route selected trends to the north, climbs over a summit of only two thousand nine hundred sixty-seven feet and drops down into Bear Creek canyon to where it merges into the canyon of the Merced.

Looking down into the depths of Bear Creek canyon from a point near King Solomon's Mine, two blazed trails show the adopted line of the State Highway with, just above it, the trail laid out by the Automobile Club of Southern California some years ago.

On all sides are to be seen evidences of mining activities of former years, for hereabouts was gold-mining country in the days of '49. Trails and abandoned roads over which, in the old days, supplies were hauled to prospectors' camps or the mills of the mines testify to past accomplishment, while rock dumps tell of long-ago burrowings after that elusive metal which beckoned to so many and rewarded so pitifully few.

From the juncture of Bear Creek to El Portal the proposed line leads up the south wall of the canyon of the Merced about fifty feet above the brawling waters of the river to El Portal, where Yosemite begins.

Aside from the county seat laterals required by law to be built four other cross-state roads connecting the valley with the coast exist in Division VI, these being the Pacheco Pass Road, the Coalinga lateral, the road over Cholame Pass and that known as the Cuyama lateral which reaches from Bakersfield by way of Maricopa into Santa Barbara County. The construction of these roads forms perhaps the biggest problem facing Mr. Woodson at the present time for they will bear a commercial as well as touring traffic and with the exception of the Cuyama lateral are to be paved with concrete.

To the eastward of the main trunk line in Division VI, a tremendous stretch of road exists originating at the south boundary of Kern County and skirting the eastern slope of the Sierras toward the north. Part of this road is built, little stretches of concrete pavement here and there having been

laid down in sandy stretches. This pavement, eight feet wide with seven-foot two-car turnouts every quarter of a mile, helps make travel a possibility, and its completion, with additional funds supplied, is only a matter of time. Opening up a comparatively unknown country, this road leads to some of the most imposing mountain scenery in America and will supply a popular touring trip when done, forming as it does a link in that long-dreamed-of east-of-the-Sierras highway.

Other roads there are in this division, other engineering accomplishments completed and waiting to be done, but the biggest problem, the one big job of this division, the road up Grapevine Canyon into Tejon Pass and on to Lebec, has been finished and the troubles incident thereto forgotten, leaving Mr. Woodson free to engage in more prosaic engineering affairs. Perhaps he may have a bit of time to wonder what he will do with the Kern-Ventura State Highway mentioned on page 25 herein which has been formally designated as a State project by a Legislature which forgot, apparently, that money is required in building roads.

CHAPTER XV

DIVISION VII—THE TEJON-CASTAIC RIDGE ROUTE AND THE COLORADO DESERT

When organization of the California Highway Commission was effected, the man placed in charge of this division was W. Lewis Clark, now division engineer of Division IV. When Mr. Clark took a comprehensive view of the territory allotted him he found that, if such a phrase is permissible, his job comprehended the sublime and the ridiculous, in so far as the development of his road system was concerned. In part the roads tentatively decided upon skirted the ocean shore, climbed over vast mountain ridges, or traced through valleys dotted with green-foliaged orchards of various kinds, where road systems were already fairly well developed; in part essayed the most grotesque and dismal desert places, where drifting sands piled up in dunes that reached 400 feet in height and wandered crazily about; in part involved the building of a road along a dead sea shore that lay far down below the level of the ocean and generally, for all around variety, was amply satisfying even to the most aspiring of engineers.

With such a choice array of road-building problems to select from, some excuse for meditation as to where to start in might perhaps apply, save for the fact that the importance of the coast and valley routes, connecting the populous sections of the state, was far and away beyond that in any other section. Of these, the matter of building the coast road between San Francisco and Los Angeles was comparatively simple, this not being true, however, of the valley route connecting Los Angeles with the north; so the coast road may be eliminated and the climb over the Tehachapi

On the Conejo Grade. State Highway in Ventura County. Coast Range Mountains in background.

Rincon Causeway in Ventura County on Coast Route State Highway.

Mountains on the valley route be regarded as the big engineering accomplishment of Division VII. The particular section of this work falling upon Mr. Clark reached up to the Kern County line, where, as outlined in Chapter 14, Division Engineer Woodson was raptly contemplating the vagaries of Grapevine Creek and the 'dobe overflow lands of the Seventeen-Mile Tangent. To effect a juncture with Mr. Woodson's district was Mr. Clark's job, Mr. Woodson's job being to meet Mr. Clark halfway, and inasmuch as we have disposed of Mr. Woodson's troubles, Mr. Clark may be given the center of the stage in his endeavors to find a safe and sane route over the Tehachapi. Between Los Angeles and Bakersfield he found but five possible lines of routing, all following the same road to Newhall, where they diverged. The most westerly of these was a road through San Francisquita Canyon, a steep, narrow, dangerous way that crossed a creek too often and was plainly beyond the economic pale. (Elimination number one.) The most eastwardly road was through the Soledad Canyon where history recorded constant washouts. (Elimination number two.) Between these two were three other roads and of these three the Boquet or Deadman's Canyon road, albeit picturesque, was not of engineering desirability owing to sharp turns, steep pitches, and threatening drainage problems; no way of joy. (Elimination number three.)

Mint Canyon was elimination number four because of its excessive length and hence expense of construction, not to mention maintenance; so Mr. Clark girded his loins, cinched up some pack mules, and went over the top via what today is the Ridge Route, which then was as trailless as the snows that Peary saw about the Pole.

The route chosen was practically a direct line between Newhall and Bakersfield, led up to the top of the mountains and there stayed for miles and miles on, to all appearance, the roof of the world with piled-up saddleback mountain ranges on every side but all below.

Just how much mesquite and chaparral and greasewood

brush Mr. Clark and his pack mule convoy plowed through is not susceptible of intelligible narration, although, as the darky says, it was mighty much. And in essaying it the engineers packed fodder and water for their horses and food and more water for themselves, finally arriving at the point of meeting with the engineer of Division VI just above Lebec, after plowing through a country where there was not even a well-defined trail. That the scarcity of water was a problem to be considered in the construction of this road may be deduced from the troubles of Mr. W. W. Patch, who succeeded to the job when Mr. Clark was transferred to Division IV, as this wholly worthy road builder, in the summer of 1919, while paving with concrete a 19-mile stretch of roadway on the very top of the mountains, found himself engaged in competition with a herd of cattle summering in that high altitude; Mr. Patch needing the water for concrete construction, the cattle needing it for personal consumption, the visible supply being inadequate for both. At any rate the route over which Mr. Clark had made his pack mule reconnaissance was adopted and today the Tejon-Castaic Ridge Route stands out, to the layman at least, for engineers were never known to agree, as one of the outstanding road-building accomplishments in California, a way that suggests in the grotesque jumble of its underlying mountains some picture from the brush of Gustave Doré.

And then Mr. Clark took charge of Division IV, which had been robbed of Mr. A. E. Loder by the United States Bureau of Public Roads, and promptly Pandora's box was opened and a left-over array of road-building troubles was dumped helter-skelter before Mr. Walter W. Patch, who was appointed division engineer. The chief of these difficulties, of course, was lack of money; for until the 1919 bond issue every division engineer was working on a shoestring and the commission generally sailing about between financial heavens and terrestrial criticism, this money trouble not being strictly engineering in dimension but applicable to mortals all—as well as engineers. So it may be eliminated and we will turn to consideration of a job that today is the out-

In El Cajon Valley east of San Diego, on the State Highway.

Before construction—a sandy, unkempt stretch of road.

After construction—concrete.

standing puzzle of the commission, a job that was in the offing when Mr. Clark was climbing about on top of the Tehachapi Mountains and that is just about as near a solution now as it was then.

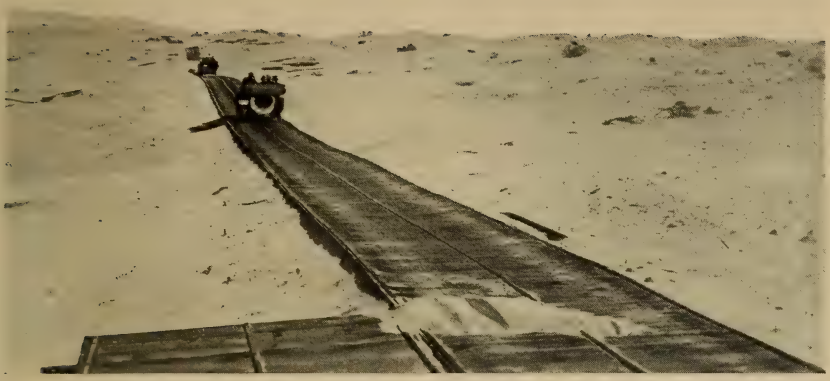
This job involves building a road over the Colorado Desert between El Centro and Yuma, Arizona, at the California line, the stretch of road involved connecting with the San Diego to El Centro branch of the State Highway and the branch reaching in from San Bernardino, passing through Riverside County and to the west of Salton Sea. Definitely adopted as a route of the State Highway—in all probability as the result of pressure brought to bear upon the Highway Commission and its engineer—abandonment of the line from El Centro east, or a rerouting thereof, would raise such a howl of protest that the mere possibility of so doing is uttered with bated breath, none the less, if there be an engineer among this audience who knows what to do he is respectfully requested to speak now or forever hold his peace. From San Diego, where connection is had with the coast route to Los Angeles and San Francisco, to El Centro, no particular engineering difficulties prevailed, rerouting of existing roads to secure a minimum grade being necessary in some places but the work mainly being straight road-building with no particular frills such as were embodied in locating and building the Tejon-Castaic Ridge Route. Nor was anything out of the ordinary encountered in building the line down from San Bernardino through Riverside County to the west of Salton Sea, paved sections already put in by Riverside County supplying a basis for future work in the neighborhood of Thermal, Coachella, and Indio. To the east of El Centro, however, or more properly speaking, from Holtville, was a situation that the most stout-hearted engineer gazed at with something which approached affright. Huge dunes made up of what is expressively designated blow-sand piled up in ever-changing formation in the Colorado Desert, where a torrid sun, lack of water, and almost unconquerable sand made travel a thing to be approached almost with prayer. All existing roads, in the old days, were merely wagon or

automobile tracks in the sand, tracks that were filled up almost as soon as made. And in this region, from heat and thirst and desert craze, many a man has wandered to his death.

In point of directness, this way across the blow-sands of the Colorado Desert is the most direct connection toward the east—taking San Diego as the starting point—and across this waste in the dune section where travel would otherwise be impossible a novel form of construction has been adopted—a plank road assembled in sections at a distant station and hauled to its location among the creeping dunes. This plank road supplants what also was known as a plank road in the days before the State Highway—two boards laid across girders like a primitive railroad track—and on these boards many an automobile made the trip, now and then falling upon evil times when a hind wheel jumped the track and settled down into the sand. A crazy road this was, humped up on one side and dropped down upon the other, writhing like a snake when the sand shifted to and fro and provided with turnouts of similar erratic construction.

The new plank road, compared to the old one, seems like a boulevard, an eight-foot road of solid crossway planking with similarly constructed turnouts, eight feet wide, holding two cars every four-tenths of a mile. But this road serving now must be kept under constant supervision, for the sands blow upon it and cover it up and make it useless. It is open only as long as the road crew of the State Highway, which has a station at a well on the edge of the desert, keeps scraping it off.

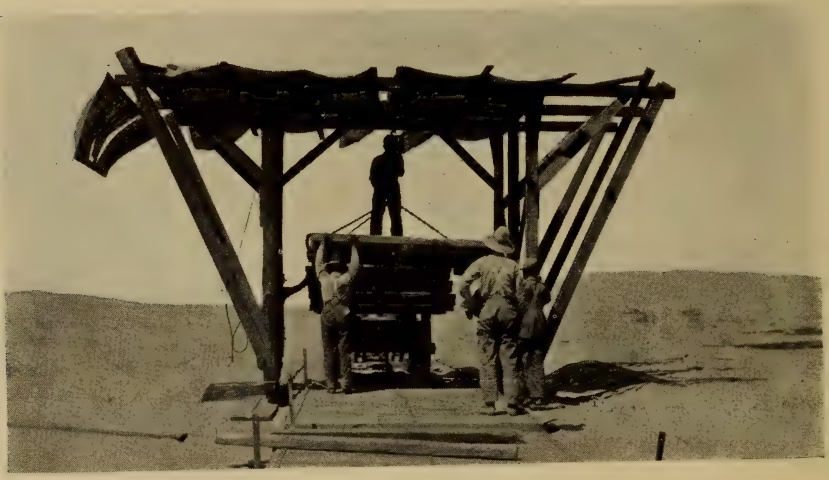
And, in addition, the sand dunes crawl—not very much it is true—but none the less they creep about the desert, shifting in form, encroaching upon the road here, covering it there, wandering this way when the wind blows from the north, another way when the wind blows from the south or east or west. Some of these dunes are four hundred feet high, fed by an inexhaustible supply of blow sand, defying sand fences and offering a problem that no engineer has yet had the temerity to say can be conquered for all time.



Plank road completed. Turn-out in left foreground

Before the era of the State Highway parallel planks served for a road.

Hauling sections of plank road out into the desert on the El Centro-Yuma Highway.



Unloading sections of plank road. Canopy protects workmen from sun.

There is travel over this road, thanks to the men who camp at the edge of the desert and scrape the plank road as part of their daily job. With the brackish water of their well they have built a tiny oasis around their shack and their corral. Green sod is started, trees are sinking their roots into the sand, which needs only water to become as fecund as the Imperial Valley proper; but like the road they tend they have no assurance that some day a dune will not creep upon and over the green spot they have grown to regard as home.

Just what development the road across the sand hills is to secure under the ample finances at last supplied to the California Highway Commission no one in authority seems to care to state even if he knows, and so it would seem, as part of Mr. Patch's job is to build a road across this disheartening area, that the old copy book maxim—about youth's lexicon having no such word as fail—must really be true, for it is his job to build a road where no road ever has been built and where no one knows how to build one that will be a permanent way.

In addition to this road, the building of another thoroughfare of far different character faces the engineer of Division VII and is worth while mentioning. This road runs along the coast from Oxnard, Ventura County, to San Juan Capistrano Point in Orange County, and is to be paved with concrete six inches thick and twenty feet wide. It must, in places, be blasted from sheer cliffs of solid rock and, save a short inland detour, all its course is along the ocean where pleasant and cool breezes blow. So when Mr. Patch gets tired of the heat-burdened monotony of the desert and its crawling dunes he can engage himself with only ordinarily difficult engineering problems to consider until he gains courage once again.

CHAPTER XVI

STATE HIGHWAY ROUTES

Route 1—San Francisco via Crescent City to Oregon.

Begins at the famous San Francisco Ferry Building and ends at the Oregon line. It is to be paved with concrete to a few miles to the north of Eureka, in Humboldt County, and is one of the most wonderful touring trips in the state, even in 1919 when only partly paved, as the roadway is well graded and practically complete in that respect up to and beyond Eureka, work from that point being now under way. Under the 1919 State Highway bond issue an extension is provided for trending inland from Crescent City toward Grant's Pass in Oregon.

Route 2—San Francisco to San Diego.

From San Francisco south to San Diego, mostly along the coast and eventually, under state and county road development plans decided upon in 1919, to be in sight of the ocean all the way. Paved with concrete for practically its entire length, it follows the line of *El Camino Real*, the King's Highway of the Spanish padres.

Route 3—Sacramento to the Oregon Line via Marysville.

Popularly known as the East Side Highway it traverses that section of the great Sacramento Valley lying east of the Sacramento River, passing through a wonderfully productive area where much rice is grown and where duck and goose shooting is to be had in season, vast flocks of those migrant fowls actually menacing the crops. To the west from the

San Francisco's Ferry Building. Here the Automobile Tourist makes his start for the upper California Coast.

In the redwoods of Mendocino County on Route 1.

highway may be seen the Sutter Buttes upthrust from the floor of the valley in eccentric array. In its upper stretch, where the valley narrows in, from this route Lassen Peak, the only live volcano in the United States, is visible, infrequently in eruption, while to the north Mount Shasta, always snow capped, lifts nearly 15,000 feet into the clouds.

Route 4—Sacramento to Los Angeles.

From Sacramento south through Stockton, Modesto, Merced, the gateway to the Yosemite, Madera, Fresno, Visalia, and Bakersfield this route leads through the lower Sacramento Valley and the San Joaquin, traverses the Seventeen-Mile Tangent south of Bakersfield and twists up Grapevine Canyon to the top of the Castaic-Tejon Ridge where it rides along, to all intents and purposes on the roof of the world, with mountain peaks all around and all below. It traverses in the valley a region of marvelous agricultural development, trends through the Kern County oil fields and passes old Fort Tejon in the mountains and then drops into Los Angeles County, burrowing through the Newhall Tunnel to its destination.

Route 5—Stockton to Santa Cruz via Oakland.

This route ties up the valley route with the coast, traverses Altamont Pass, goes through Dublin Canyon, touches Oakland and trends south on the east side of San Francisco Bay past Mission San Jose, through San Jose, the modern city, and from Los Gatos climbs over the Coast Range mountains. It is mostly paved, is easily and safely traversed, and connects the warm interior valleys of California with the popular bathing beaches of Santa Cruz. It is a short route easily accessible from San Francisco and is, so far as the western end is concerned, one of central California's most popular tours. From Oakland east it forms the main commercially traveled line of the State Highway.

Route 6—Sacramento to Woodland Junction.

Should be properly Sacramento to Davis and forms a con-

nection between Sacramento and the State Highway line which reaches from Benicia to Tehama junction, designated formally by the Highway Commission as Route Seven. This little stretch of highway is interesting in that it crosses the 16,538 foot Yolo-Sacramento Causeway described in Chapter XI.

Route 7—Tehama Junction to Benicia.

Forms a connection between San Francisco and the Sacramento-Oregon line of the State Highway, crossing the ferry to Martinez from Benicia and at Martinez connecting with another link of the State Highway that leads to Oakland. Passes through Tehama, Glenn, Colusa, Yolo, and Solano Counties and is worth while in that it affords a view of the Sacramento Valley's agricultural development. At Benicia is the only United States arsenal on the Pacific Coast; at Vallejo, a few miles away, is the Mare Island Navy Yard; while at Davis the University Farm of the University of California is one of the interesting and highly developed schools of agriculture in the West.

Route 8—Ignacio to Cordelia via Napa.

This route taps Route Seven at Cordelia, a few miles north of Benicia, traverses Jameson Canyon, passes through the lower part of the beautiful Napa Valley and on into Sonoma County near the little town of Sonoma, where the farthest north Mission is and where the Bear Flag of the California Republic was raised. Thence by the way of the Black Point Cut-off, a road across the lower Sonoma Valley marshes, it leads across Petaluma Creek by a big bascule drawbridge to the San Francisco-Oregon coast-line highway. It is part of the great boulevard which completely encircles San Francisco and San Pablo bays.

Route 9—San Fernando in Los Angeles County to San Bernardino.

The "Foothill Boulevard," one of southern California's most attractive short tours at the foot of the mountains,

passing through Pasadena and supplying a connection to at least two transcontinental roads. All paved in 1919.

Route 10—Visalia to San Lucas.

The Coalinga lateral of the State Highway, connects valley and coast routes. In 1919 hardly more than a survey mainly over existing roads. Is to be paved with concrete. Affords a way to the coast from the interior and will carry much travel. It passes through the oil-producing section of Fresno County at Coalinga and will serve a heavy volume of traffic when done.

Under the 1919 State Highway bond issue an eastward extension of this route is provided for to be paved from Visalia to the Sequoia Park line. See chapter on Tulare County.

Route 11—Sacramento to Nevada Line via Placerville.

Paved to Placerville in 1919. Passes through the California of the days of '49 when Placerville was Hangtown. A few miles from Placerville is where Marshall discovered gold in California; good road to this historic point put in by El Dorado County. It is the most popular route to Lake Tahoe. Was formerly the Lake Tahoe Wagon Road over which Hank Monk drove a stage and Horace Greeley traveled on his way to Virginia City and was the first road to be taken over by the state, long before the days of the State Highway. Part of this route, from Placerville to Sportsman's Hall, is to be paved with concrete with funds provided for in the 1919 bond issue.

Route 12—San Diego to El Centro.

Is paved, in practical entirety, in 1919 from San Diego to El Centro and carries a heavy volume of travel from the Imperial Valley to the coast. Is an attractive scenic road, affords a splendid view of San Diego and its environs, and looks off into Mexico. Toward the east, from the summit, a panoramic view of great scope may be had of the Imperial Valley and the mountains beyond.

Route 13—Salida to Junction.

This is the Sonora lateral from the San Joaquin Valley main highway. Leaves main line at Salida in Stanislaus County just above Modesto, paved practically to Stanislaus County line and will be paved completely to Sonora in 1920. Passes through middle fork of Stanislaus River and through Stanislaus National Forest, climbs Sonora Pass, 9624 feet in elevation. Grades in the mountains so steep as to make automobile travel precarious. Mostly used by sheepmen. In scenery is equal to the Alps almost but expense involved in making it an easily traveled highway will scarcely be justified for years.

Route 14—Albany to Martinez.

Part of the Round-the-Bay Boulevard and is a short stretch between Oakland and Martinez. Is very scenic, high up on the hills above the Straits of Carquinez and gives a view of the delta regions at the mouth of the Sacramento and San Joaquin rivers. Forms a link in the highway from San Francisco and Oakland to the Sacramento Valley and Oregon by way of a ferry crossing from Martinez to Benicia. About the crookedest stretch of road in the whole State Highway but worth while traveling. All paved.

Route 15—Williams to Colusa.

This is the lateral reaching Colusa, the county seat of Colusa County. All paved and passes through a grain and rice producing section. From it may be seen the Sutter Buttes to the east. Under the 1919 state bond issue, which supplies connecting links between this route and Routes 37 it forms part of what is popularly known as the Tahoe-to-Ukiah highway, a cross-state road forming a shortcut connection between Nevada points and the upper California coast which is two hundred twenty-two miles in length, passes through Marysville, Yuba County; Yuba City and Meridian, Sutter County; Colusa and Williams, in Colusa County, and thence across Lake County to a con-

The Government has charge of the roads in Yosemite Valley, and is constantly at work extending and improving them.

Well No. 1, east of El Centro.

State Highway in Colorado Desert.

nection with the State Highway at Ukiah, Mendocino County.

The Tahoe-to-Ukiah highway is a much-needed road, both scenic and commercial in aspect, and in part at least is to be paved with concrete.

Route 16—Hopland to Lakeport.

This is the Lake County lateral from the Coast Highway running from San Francisco to Oregon. It leaves the main line at Hopland, Mendocino County, climbs over Free Road Grade from the summit of which a splendid panoramic view is to be had of the Ukiah and Sonoma valleys, Mount St. Helena, Mount Konocti, and Clear Lake. Is under construction in 1919.

Route 17—Roseville to Nevada City.

This route leaves the highway which runs up the east side of the Sacramento Valley from Sacramento to Oregon at Roseville and follows the highway which leads over the Sierras to Donner Lake, Truckee, Lake Tahoe, and Nevada as far as Auburn. There it turns north and reaches Nevada City and Grass Valley, where gold mining is still the principal industry. Is paved in good part and will be entirely paved in 1920.

Route 18—Merced to Sequoia.

This is the road into Yosemite and it is so well known as to need little description. It leaves the Sacramento-Los Angeles Highway at Merced, is practically paved to Mariposa and there turns north and winds down Bear Creek Canyon to the canyon of the Merced River. To El Portal, the entrance to Yosemite, it follows the Merced River, and is the road for the paving of which Rudolph Spreckels has raised nearly $1,000,000. The stretch down Bear Creek and up the Merced Canyon is entirely new, avoids the heavy grades and high altitudes of the old road and will, when completed, open the Yosemite to travel during the whole year. It is destined to be one of California's most popular motoring trips.

Route 19—Riverside Lateral.

This is a short stretch connecting the city of Riverside in Riverside County with the main line of the State Highway. It runs through a thickly settled country and is attractive, as all other highways in southern California are attractive, its only particularly novel feature being that it affords direct access to the road up Mount Roubidoux.

Route 20—Redding to Coast Highway via Weaverville

This is a cross-country tie-up in the northern portion of the state between the Sacramento Valley and the coast highway. It starts at Redding, passes through the old and practically abandoned mining town of Shasta, reaches Weaverville, the county seat of Trinity County, and thence trends to the west, connecting with the coast highway north of Eureka. It is being built by the State Highway Commission with funds in part supplied by the state, in part by the Government, and in part by Humboldt and Trinity Counties, and runs through an ideal hunting, fishing, and camping region practically unspoiled by man.

Route 21—Richvale to Oroville.

This is the county seat lateral connecting Oroville, the county seat of Butte County, with the Sacramento Valley highway. It is paved with concrete in 1919. An extension of this route is provided by the 1919 State Highway bond issue reaching from Oroville to Quincy, Plumas County, through the canyon of the Feather River, presumably. This extension, ninety-two miles in length and of great scenic interest, involves extremely expensive construction work, and was accepted with groans by the California Highway Commission. It will be surfaced with local material.

Route 22—San Juan Bautista to Hollister.

This is the San Benito county seat lateral connecting Hollister with the coast highway. It leaves the highway at the northern approach to the San Juan grade at the old

On the State Highway east of the Sierras in Mono County. Mount Tom in background.

The new way into Yosemite down Bear Creek from Mariposa. Canyon of the Merced River in background.

Spanish town of that name, where is an old Mission, and supplies access to the Pinnacles, a show place, little known, on the San Benito-Monterey county line. In 1919 this route was added to by an eight-mile extension connecting Hollister with the Pacheco Pass road, Route 32.

Route 23—Saugus to Route 11 at Alpine Junction.

This route originates in Los Angeles County, is popularly called in the section which it traverses El Camino Sierra, and is due in large measure to the Inyo County Good Roads Club under the leadership of W. G. Scott, who for years has dreamed of a highway north and south to the east of the Sierras. It starts out through Mint Canyon in Los Angeles County, which is practically all paved, crosses a portion of the Mojave Desert and passes Owens Lake, the site of the Los Angeles water supply, and thence runs up the Owens River Valley to the east of Mount Whitney, the highest mountain peak in the United States proper.

From the Owens River Valley to the west is one of the most marvelous skyline vistas in the United States, Mount Whitney dominating the entire landscape while the mountains drop sheer to the floor of the valley without intervening foothills. North of Mount Whitney it passes Mono Lake, in the high Sierras, where cattle grazing country exists upon the high plateaus around Bridgeport, Mono County, and thence to Alpine Junction near Lake Tahoe, where it connects with another route of the State Highway. It is practically unpaved, has some stretches of eight-foot concrete road with turn-outs in the Owens River country above Independence, but to one who loves sublimity of scenery is amazingly worth while.

Route 24—Lodi to Silver Creek.

This route leaves the valley highway near Lodi between Stockton and Sacramento, passes through San Andreas and on into the high Sierras, connecting with the El Camino Sierra Route 23. Is essentially a mountain road, has scarcely been touched past San Andreas, to which point it has been

paved, but is interesting in that it leads close up to the Calaveras Big Trees.

Route 25—Nevada City to Downieville.

This route connects Nevada City, the county seat of Nevada County, with Downieville, the county seat of Sierra County, and hence with the State Highway. It runs through a rugged and attractive country and will, when completed, be a popular trip among those who like to get out into remote places where trout fishing is mighty good.

Route 26—San Bernardino to El Centro.

This routing extends in a general southeastwardly direction from San Bernardino through Riverside County into the Imperial Valley at El Centro, where it connects with the highway which reaches San Diego. In the central part of Riverside County it passes the Whitewater River, runs through Indio and Coachella, passes near Thermal and Mecca and thence to the west of the valley wherein lies the Salton Sea. Near Indio and Thermal it passes date ranches, now reaching a wonderful stage of development under the fostering care of the Government, which maintains experiment stations where one, after preliminary negotiations with the proprietors, may pick fresh dates from the palms and learn what dates really are.

South from Thermal the way leads, as has been said, to the west of the Salton Sea. This amazing body of water is below sea level. All around is desert. On the hills high above where the road now is and encircling the whole valley a water-worn mark upon the rock-buttressed, desert hills tells of some distant time when a great inland sea was here, and now and then a little patch of eight-foot concrete road with two-car, seven-foot turnouts is to be found where the vast expanse of hard-to-get-through sand is more than usually impassable.

From Fig Tree John's at the north end of the Salton Sea, the way is through desert sand, in sight of desert mountains, in as bleak a country as the mind of man can conceive clear

This eight-foot concrete highway with two-car turn outs every 4-10 of a mile is near the Salton Sea in Imperial Valley.

The problem of building roads across deserts where the sand drifted like snow confronted the California Highway Commission.

down to the south of the vast body of water where the way leads through Brawley to El Centro. This route only touched as yet is to be improved sometime, and when it is, it will carry a volume of sightseeing tourists for it will supply a loop tour from Los Angeles, through San Bernardino, Riverside, Brawley, El Centro and back by way of San Diego and the coast. An interesting way.

Route 27—El Centro via Holtville to Yuma, Arizona

This route proves the existence of the impossible. It reaches across the Colorado Desert from El Centro to Yuma.

An old plank road was formerly here with parallel planks off which automobiles occasionally slipped into exceeding bad luck. Now a new plank road, built in sections and hauled into the desert, has been laid down over the worst going. A bit of oiled road also has been put down. By dint of eternal vigilance the Highway Commission keeps this way open, having established a maintenance station from which a crew with scrapers operates.

Just about as fast as they get the sand scraped off it blows back. Just about as fast as it blows back they scrape it off enabling travel to pursue its sandy way. Some of the dunes are 400 feet high and they shift eternally, encroaching upon the road in some places, receding from it in others, but always moving.

What the Highway Commission is going to do it doesn't know, and nobody else does. Expert advice has been received from many non-technical road enthusiasts, some of whom have suggested sand sheds, similar to the snow sheds of the Sierras, others a tunnel like that proposed under the English Channel between England and France, while others have advocated a structure like the Yolo Causeway properly magnified. In the meantime the Highway Commission keeps silent, the sand keeps blowing and the maintenance crew keeps scraping with the result that a sort of balance has been established which makes travel safe where once it was extremely dangerous. The lover of the unusual will like the trip over this route.

CHAPTER XVII

STATE HIGHWAY ROUTES—(Continued)

Route 28—Redding to Alturas.

The county seat lateral from Redding on the upper Sacramento Valley highway to Alturas, the county seat of Modoc County. It runs over a remote mesa to the east and south of Mount Shasta and to the north of Lassen Peak, and has no strikingly attractive features, save that good fishing and hunting, mighty good fishing and hunting, are thereabouts to be had—for deer are in the yellow pine forests and utterly uneducated trout are in the seldom-visited lakes.

Route 29—Red Bluff to Susanville.

This route connects Susanville, the county seat of Lassen County, with the upper reaches of the Sacramento Valley highway at Red Bluff. It has been scarcely touched as yet so far as construction work is concerned, is largely similar, in so far as character of country is concerned, to the Redding-Alturas lateral, and passes close to the base of Lassen Peak, touches Lake Almanor, a famous body of water backed up by a huge dam put in by the Pacific Gas and Electric Company for power purposes, and, finally, near Susanville, reaches a lumbering region where, at Westwood, are huge mills. Under the 1919 state bond issue an extension is provided fifty-three miles in length to the Nevada line, from which place Nevada is building a road to Reno.

Route 30—Oroville to Quincy.

This is the famous and much-disputed-over Feather River

In the yellow pine woods of Modoc County on Alturas lateral where there is good hunting.

Putnam and Valentine, Photo.

The Hundred-and-One-Mile Drive. Built by San Bernardino County and taken over by the state.

Canyon route, and constitutes the Plumas County lateral to the Sacramento Valley trunk line of the State Highway which it reaches by the Oroville lateral. This lateral was provided for under the first State Highway bond issue, different routes being surveyed from time to time, the Feather River Canyon route being finally adopted, and funds therefor—possibly sufficient—set aside in the 1919 bond issue. It is a scenic route undeniably, running through the canyon of the Feather River, this canyon being a gorge with walls that are just about straight up and down. It is claimed to be the only pass over the Sierras in the northern portion of California that is free from snow except for a couple of weeks each year, and involves a mass of heavy and expensive construction work.

It is one of the most scenic of the State Highway routes, trends through an ideal hunting and fishing country and, in addition, supplies Quincy in Plumas County with a way to the outer world.

Route 31—San Bernardino to Barstow.

This route climbs over Cajon Pass from San Bernardino and reaches to Barstow in the midst of the Mojave Desert. It is paved, thanks to San Bernardino County, to the very top of Cajon Pass and is to be further improved by the State Highway commission, connects with that important highway which sweeps to the west from Topoc, Arizona, across a wide arched bridge and then from Needles traverses the vast width of San Bernardino County and carries its full burden of transcontinental travel into California, the Cajon Pass over which the Salt Lake Railroad climbs being popularly known as the gateway into southern California.

Route 32—From Califa to Gilroy.

Popularly known as the Pacheco Pass road, this route supplies a short and direct connection between the coast and valley highways. Originating in Fresno County on the east, passing through Merced County, and then climbing over not particularly interesting hills and dropping into

Santa Clara County, it connects with the coast line at Gilroy. It is a needed route, has merely been surveyed so far but will bear a big volume of traffic in summer, made up of residents of the hot interior valleys seeking the beach resorts of Santa Cruz and Monterey.

Route 33—Bakersfield to Paso Robles.

Just about the same kind of a road as the Pacheco Pass. It affords a cross tie-up between coast and valley highways between Kern County and San Luis Obispo County. It passes through richly producing oil fields in Kern County, is paved there, thanks to the enterprise of the people, and forms an important link in the State Highway system.

Route 34—Arno to Picketts Junction.

This route runs to the eastward from the Sacramento-Los Angeles valley highway, leaving it at Arno in Sacramento County; is paved for a short distance, thanks to Sacramento County; and reaches Jackson, Amador County, supplying the county seat lateral thereto, required by law. From Jackson it climbs over the Sierras by way of the Kit Carson Pass and connects in Alpine County with the highway which reaches up on the east side of the Sierras.

It forms or will form when it is put in shape, for in 1919 it is hardly more than a survey along existing roads, a mighty interesting trip past mountain lakes, through rugged scenery where are great precipices along which the road skirts, and through the old-time mining country of California, where today gold is being produced.

Route 35—Peanut to Kunz.

This route is popularly called the Peanut Road and properly so for it doesn't touch the State Highway at all. It originates some distance south of Weaverville, the county seat of Trinity County, and is connected therewith by county roads. It connects at its other end with Trinity and Humboldt county roads that in turn connect with the coast line State Highway a little south of Eureka and is kept in

Up Levining Creek Canyon on Tioga Road.

State Highway in the mountains of Mono County.

Looking down from the summit of the Sierras on Donner Lake. On the Auburn-Truckee-Verdi Highway.

good shape by the California Highway Commission. It traverses a remote section of the state where deer leap out of the road now and then and where trout are to be had.

Route 36—Downieville to Mount Pleasant.

In Sierra County. Doesn't go anywhere particularly and is about as crooked and steep a short stretch of road as one could wish to see. Some astute legislator wished this on the State Highway commission.

Route 37—Auburn to Truckee.

This is a link in the road over the Sierras which affords an alternative way to Lake Tahoe from Sacramento, the other way being by Placerville touched upon under Route 11. It climbs over the Sierras, looks down upon Donner Lake, where the Donner party froze and starved in the early days, is fairly well paved nearly up to the top of the Sierras on the western slope and reaches Truckee, from which place under the 1919 bond issue it has been extended to the California line near Verdi, Nevada. Will be, in part only, paved with concrete. Supplies a vastly worth-while scenic trip. See Route 15.

Route 38—Myers to Truckee via McKinneys and Lake Tahoe.

This route forms a link, the northern link it may be said, in the east-of-the-Sierras highway connecting Myers in El Dorado County with Truckee. It is a scenic road fairly well improved and cared for, skirts the shores of Lake Tahoe and trends down the upper reaches of the Truckee River to Truckee through a country so well known and so attractive as to need little comment. See Route 15.

Route 39—Tahoe City to Nevada Line at Crystal Bay.

This short route skirts the north shore of Lake Tahoe and is a popularly traveled road.

Route 40—From Montezuma, in Tuolumne County, over the Sierras to the Highway on the Eastern Slope.

This is the Tioga and the Big Oak Flat Road which scales the Sierras at 9940 feet over Tioga Pass. It is of wonderful scenic attraction, passing for a long distance through Yosemite National Park—not the valley—and the Tuolumne Meadows, and is generally a fine camping area. It has easy grades, is cared for jointly by the State Highway Commission and Government, and is one of California's most popular tours.

Route 41—General Grant Park to Kings River Canyon.

Is a stretch of road in the southeastern part of Fresno County; is not connected with the rest of the State Highway system except by county roads but is in one of the most scenic and least known sections of California and should be visited by everyone. Additional funds were supplied for this road by the 1919 State Highway bond issue. See Fresno County.

Route 42—Saratoga Gap through Redwood Park to Bloom's Mill.

This is the Big Basin road, popularly called. It is close to San Francisco, connecting with the State Highway at Saratoga in Santa Clara County and is probably the most attractive touring trip close to San Francisco Bay. A huge redwood grove, set aside as a state park and popularly known as the Big Basin, is reached by this road, which is now under improvement and eventually will be paved.

Route 43—San Bernardino to Bear Lake.

Popularly known as the One-Hundred-and-One-Mile Drive on the Rim of the World. It is. See San Bernardino County. A change in route was made by the 1919 State Highway bond issue involving a fourteen-mile stretch between Deep Creek and Metcalf Creek.

Route 44—Boulder Creek to Redwood Park.

This is a connection between the Santa Cruz County paved highway system and the Big Basin road, Route Forty-two.

Route 45—Willows to Route 3.

North of Biggs. Made State Highway by special act of the Legislature in 1919; no funds therefor, however, were supplied.

Route 46—Klamath River from Valley Highway Near Hornbrook to the Coast Highway North of Eureka.

A joint state and Federal enterprise, one hundred seventy-seven miles in length. Follows canyon of Klamath River, passes through Trinity National Forest, and will be, when developed, one of California's most interesting scenic trips, reaching into a little-known section of the state. To be surfaced with local materials.

Route 47—Orland to Chico.

A cross tie-up twenty miles in length between east and west side Sacramento Valley highways. To be paved with concrete.

Route 48—McDonalds to Mouth of Navarro River.

Is forty-seven miles in length. Leaves Coast highway at Sonoma-Mendocino county line, passes through Anderson Valley in Mendocino County, and will be the first state road reaching the coast north of San Francisco.

Route 49—Calistoga to Lower Lake.

Connects road systems of Napa and Lake counties, about thirty-two miles in length but was not restricted as to route. Will supplant an existing toll road and is probably to be paved with concrete.

Route 50—Rumsey to Lower Lake.

Connects the road system of Yolo County with Lake

County points. Follows Cache Creek canyon most of the way and will form an attractive touring trip. Is thirty-five miles in length and is to be paved with concrete.

Route 51—Schellville to Santa Rosa.

Forms a short-cut connection between two State Highway lines in Sonoma County, passes the farthest north of California's Missions, at Sonoma, and traverses the beautiful Sonoma Valley, Jack London's "Valley of the Moon." It is twenty-four miles in length and is to be paved with concrete.

Route 52—Tiburon to Alto.

In Marin County, five miles in length and intended to supply additional ferry service and relieve traffic congestion at Sausalito. Will be paved with concrete.

Route 53—Rio Vista to Suisun-Fairfield.

In connection with the paved highway systems of San Joaquin and Sacramento counties forms a short cut through Solano County between interior points and the California upper coast, is twenty-four miles in length, and is to be paved with concrete.

Route 54—Michigan Bar to Dry Town.

An extension, twelve miles in length, of the Sacramento County highway system into the old-time mining region of California. Will connect Sacramento with Jackson, county seat of Amador County.

Route 55—Skyline Boulevard, San Francisco to Santa Cruz.

A co-operative undertaking sixty-seven miles in length by the state and San Francisco, San Mateo, Santa Clara and Santa Cruz counties. Will supplement the present highway south from San Francisco, relieve a congested traffic condition, and supply an extremely attractive drive. Is to be paved with concrete twenty feet in width and six inches in depth.

Route 56—Carmel to San Simeon.

Along the coast through lower Monterey and upper San Luis Obispo County. Is ninety-seven miles in length, passes through the Monterey National Forest, and will supply a wonderfully scenic route. To be surfaced with local material.

Route 57—Freeman to Santa Maria.

From the State Highway at Freeman, in the eastern part of Kern County, to the State Highway at Santa Maria, in Santa Barbara County. Is two hundred two miles in length. Practically crosses Kern County from east to west, follows the Cuyama River through Santa Barbara County. Crosses the lower end of the Sierras over Walker's Pass and, where paved roads are not supplied by Santa Barbara and Kern counties, will be surfaced with local material.

Route 58—Needles to Mojave.

This route, two hundred fifty-five miles in length, extends entirely across San Bernardino County in a general eastwardly and westwardly direction, with an extension into Kern County, where connection is had with an existing State Highway route.

The eastern terminal is commonly regarded as Needles, California, but as a matter of fact is on the California line opposite Topoc, Arizona, a few miles below Needles, at which point a wide span crosses the Colorado River.

This route, in so far as San Bernardino County is concerned, was comprehended in the state's road plan through the work of Supervisor R. L. Riley of San Bernardino County, and is touched upon in the chapter which deals with that county.

It will form one of the main entrances into California for transcontinental travel, will be principally a touring road, and is to be surfaced with local material.

Route 59—Lancaster to Baileys.

This route, forty miles in length, traverses the Antelope

Valley in Los Angeles County, supplies a cross-line between the State Highway route which trends north to the east of the Sierras, and the Ridge route. Will be paved with concrete. Connects with Los Angeles from Lancaster by way of Mint Canyon.

Route 60—Oxnard to San Juan Capistrano.

From Oxnard, in Ventura County, to San Juan Capistrano, in Orange County, one hundred thirty miles. Passes through Ventura, Los Angeles, and Orange counties and follows the shore line of the Pacific throughout.

This is a scenic route, is to be paved with concrete twenty feet wide and six inches thick, as it will bear no little commercial traffic, and supplies an alternative route to an already existing stretch of State Highway.

Route 61—La Canada to Mount Wilson.

A co-operative undertaking shared in by the state, Los Angeles County, the city of Pasadena, and the United States Forest Service. It penetrates an outing section to the north of Mount Wilson, is ten miles in length, and is commonly known as the Arroyo Seco Drive. To be surfaced with local material and in time will probably be connected with Route 62.

Route 62—Azusa to Pine Flat.

Also in Los Angeles County and also a co-operative undertaking in which the state, the county, and the Forest Service participate. It is, in part, in the Angelus National Forest and opens up an attractive camping place. Is to be surfaced with local material and will sometime be connected with Route 61.

Route 63—Big Pine to Oasis.

A high Sierra scenic road in the Inyo National Forest connecting the State Highway line east of the Sierras with Nevada points by way of Westgaard Pass. Is forty miles in length and will be surfaced with local material.

State Highway to Jackson, County Seat of Amador County, showing high school.

In the Mojave Desert on the Barstow-Needles State Highway.

Route 64—Mecca to Blythe.

Through the desert section of Riverside County for one hundred miles. Forms a short-cut route for transcontinental tourists into California and when taken over by the State relieved Riverside County of its most harassing road problem. See chapter on Riverside County.

CHAPTER XVIII

CAMPAIGNING FOR GOOD ROADS

"The first thing to do," said some long-forgotten wit when discussing the best formula for the construction of rabbit pie, "is to go out and get your rabbit." The main thing to do when road improvement is contemplated is to provide funds, and these funds, in any comprehensive highway development plan, can rarely be acquired by any other method than by the issuance of county bonds—the building of roads out of moneys raised by direct tax being too slow a process save in a few isolated instances where highway needs are unusually small and financial capacity is unusually large.

It may properly be said that the building of good roads involves four separate processes: First, the creation of a sentiment therefor; second, the development of such a system as will best meet with the general county need; third, the securing of the rabbit, the needed funds; and, fourth, actual road construction.

Happily, in California the first of these processes is now a very simple affair, for so many county highways have been put down that there is scarcely a man or woman or child in this state who does not know the actual money-saving, economic value of the good road. This condition was not, however, always existent and as recently as 1916 the Good Roads Bureau of the California State Automobile Association was quite a busy department. Like George Ade, when he was working for his first boss, it had a comparatively lazy time, being allowed anywhere from twelve to eighteen hours to finish up its day's work.

This work began, in its preliminary stages, by sending out to all the newspapers of the county which was being invaded

This picture with title was used with success in a County bond campaign. Road shown is to be paved with concrete.

This picture was used with good effect in the Merced County good roads bond election—concrete in Stanislaus County, chuck holes in Merced County.

statistics telling how hauling costs were cut, how property values were increased, how the good road helped the country school, the country housewife, the man who sold and the woman who bought all kinds of country produce—this material, in the main, being supplied by various publications put forth by the United States Department of Agriculture through its Bureau of Public Roads.

Meetings were held in schoolhouses and halls before the various Parent-Teachers Associations, Mothers Clubs, Granges, Farm Bureau centers, and similar organizations until such a time as sentiment in favor of highway improvement had crystallized sufficiently to discuss the development of some definite plan.

Then a delegation of citizens usually called upon the County Board of Supervisors, which, in most instances, was waiting to be asked to do something that it really wanted to do and was willing to lend a very receptive ear, whereupon the question of how great a road mileage should be put in and where the proposed roads should be built became at once the main issue.

In this connection it may be said that not one single county in which the Good Roads Bureau has campaigned has been able to provide all the roads that everybody wanted, so the development of such a system as would secure the two-thirds majority needed to pass a bond issue has always assumed a more or less puzzling aspect.

In meeting this situation one agency has done more than all others to pour oil upon the troubled waters and to consolidate public sentiment upon a feasible plan, this agency being the United States Bureau of Public Roads, which, upon application from the proper source, has sent its road-building engineers into the various counties, has investigated the existent economic demand and adjusted it to the existent financial capacity, recommending such a road system as would best respond to the general county need.

The value of this service has been almost immeasurable, for, while the tendency of human nature is to regard any plan developed by one's daily associates as being subject to criti-

cism and not above reproach, the dictum of an engineer of the United States Bureau of Public Roads assumes almost the aspect of Holy Writ. In the first place he is a road-building engineer whose competency is guaranteed. In the second place the honesty of his purpose and his personal integrity are above suspicion. He has no personal axe to grind; is not commercially interested in this material or that material which goes into road making. He has no local interests, does not own property in the county and so is free from any personal prejudice or bias. He studies the county from a traffic standpoint, views soil conditions, investigates the financial capacity of the county, and reports, laying out such a system as will meet with general county needs and come within the realm of possibility from a financial standpoint, suggesting even the life and rate of interest on the proposed bonds. And then he bows himself out, every cent of his salary and expenses being paid by the Government, which supplies an implied guarantee that his recommendation is sound, wise, and economical in every respect. Usually the advice of the Bureau of Public Roads has been accepted, with occasionally minor changes.

And then comes that trying period when active campaigning for the proposed bond issue takes place.

First of all every newspaper in the county is enlisted in the cause, then more meetings are held, stereopticon lectures are delivered that ramble as far back as the Appian Way, and lantern slides are shown of what other counties are doing and of what the particular county on the dissecting table has not done.

"Movies" show pictures of children slipping and sliding to the one-room schoolhouse over muddy roads in comparison with children going dry-shod over paved highways to the modern union school in the modern motor bus, as well as automobiles struggling in the embrace of mud.

The matter of getting crowds to listen to good-roads speeches, which, in all humility, are admitted to be as lacking in attractiveness as the Dismal Swamp, is easily accomplished by renting some of the earlier reels of Messrs. Fair-

Demonstration concrete highway put down during State Fair at Sacramento. This educational work was carried on during the 1916 State Fair by the California Highway Commission co-operating with the Sacramento County Good Roads Association to boost the County bond issue.

This picture was used with success in the Sacramento bond election. The stretch shown has been paved with concrete.

banks, Arbuckle or Charley Chaplin by way of entertainment, serving last as dessert to hold the crowd, a two-weeks' campaign of daily and not infrequently two daily meetings being just about as much of active campaigning as the average mortal can stand.

In the meanwhile the women are always busy, each woman with a certain section of the local telephone book allotted to her, calling up different people, finding out how they stand, converting them if conversion is needed, and urging upon them the necessity of going to the polls on election day.

Post cards from women in the country to women in the city, if the urban campaign situation justifies, asking them as sisters to help get good roads from the farm to town, or from city women to country women on the theory that better roads will supply a better market for farm produce if the campaign situation is reversed.

Then on election day, as under California laws sixty-seven out of every one hundred votes must be recorded in favor of good roads to carry the issue, the use of the telephone is redoubled and automobiles are put forth to carry favorable votes to the polls, in most instances the women who have been interested in the campaign working harder than the men and almost invariably recording a larger percentage of the vote.

To enter at length into detail as to the good-roads campaign methods used by the people of California in their fight for better highways would involve the infliction of another book upon the long-suffering public, but in the main they have been sufficiently set forth, and that they have served to accomplish the desired result is by way of being a testimonial to their efficacy.

But in the main the biggest factor, since 1916 at least, has been the Bureau of Public Roads, which at that time established a district office in San Francisco, C. H. Sweetser being put in charge as district engineer. In January, 1918, Mr. Sweetser entered the army as captain of engineers and saw active service, following which he resigned his captaincy and in August, 1919, took charge of the office which he had left.

In his absence Mr. B. J. Finch served as district engineer, being transferred to District 12, with headquarters at Ogden, Utah, upon Captain Sweetser's return. Under the direction of these men the Bureau of Public Roads has helped mightily in keeping the California standard of road building up to a high mark and has had in the field at various times Senior Highway Engineers W. H. Lynch, E. J. Wulff, and D. E. Henry, the latter being now detailed to this work.

That the United States Bureau of Public Roads will play a continuing part in the highway development of California for some time to come is assured by the fact that in the next few years the United States will expend in this state approximately $9,000,000 in Federal aid of post and forest roads, the construction of which it is the function of this governmental bureau to oversee.

Including this sum, the amount of money to be expended in California during the six years, beginning with 1920, on road construction approximates the enormous total of two hundred million dollars. This includes road, highway, and bridge construction, maintenance, and repairs, and is derived as follows:

Unexpended funds 1916 State Highway bond issue	$4,000,000
State bond issue 1919	40,000,000
County bond issues, voted and proposed	27,000,000
Automobile license fund, state and county	20,000,000
Federal Aid post and forest roads	9,000,000
Funds derived from county taxes	100,000,000
	$200,000,000

This estimate is conservative rather than otherwise, assuming that the present prosperity will continue throughout the United States during the period covered, at the end of which time California, already leading her sister states in highway development, will have made such further progress as perhaps to excuse Californians for boasting a bit over the development of California's highways.

CHAPTER XIX

CALIFORNIA'S GOOD ROADS COUNTIES

IN SUPPLEMENTING the State Highway system the counties of California have shown a progressive spirit in the development of paved highway systems, both by bond issue, by direct tax on the pay-as-you-go theory, and by the intelligent use of current road funds, the following bond issues having been passed in the year and amount set forth:

Year	County	Interest Rate	Amount
1867	Lake	5	$48,000.00
1907	Plumas	4	100.000.00
1908	Sacramento	4½	825,000.00
1909	Los Angeles	4½	3,500,000.00
1909	San Joaquin	5	1,890,000.00
1909	San Diego	4½	1,250,000.00
1911	Glenn	5	450,000.00
1911	Ventura	5	275,000.00
1912	Orange	5	100,000.00
1912	San Benito	5	300,000.00
1913	San Mateo	5	1,250,000.00
1913	Orange	5	1,160,000.00
1913	Kern	4½	2,500,000.00
1914	Riverside	4½	1,125,000.00
1914	Colusa	5	290,000.00
1915	Santa Barbara	5	350,000.00
1915	Ventura	5½	1,000,000.00
1915	Monterey	6	570,000.00
1915	San Bernardino	5	1,750,000.00
1916	Sacramento	4½	1,750,000.00
			$20,483,000.00

Year	County	Interest Rate	Amount
	Carried forward		$20,483,000,00
1916	Stanislaus	5	1,482,000.00
1917	Tulare	5	2,200,000.00
1917	Alameda	5	200,000.00
1918	Merced	5	1,250,000.00
1919	Fresno	5	4,800,000.00
1919	Sonoma	5	1,640,000.00
1919	Napa	5	500,000.00
1919	Santa Cruz	5	924,000.00
1919	Imperial	5	1,000,000.00
1919	Ventura	5	580,000.00
1919	Modoc	5	400,000.00
1919	Contra Costa	5	2,600,000.00
1919	Yolo	5	1,000,000.00
1919	Sutter	5	810,000.00
1919	San Diego	..	2,300,000.00
	TOTAL		$42,169,000.00

Of these bond issues the Lake County issue was "to satisfy a judgment and buy a toll road," the Plumas County issue was for bridges, and the Glenn County issue was intended mainly to supply bridges for the State Highway, the Colusa County issue being for State Highway rights of way and bridges. The 1911 Ventura County bond issue was voted for a State Highway bridge, while the entire $275,000 raised in Santa Barbara was used in supplying bridges and paving roads for the State Highway Commission, then at the height of its troubles.

The San Diego bond issue of 1909 was voted merely for the establishment of engineering grades, a supplementary bond issue being passed in the latter part of 1919 to pave these roads, while San Benito County in 1912 and Modoc County in 1919 did not comprehend any paved road work in their bonding plans, merely the establishment of engineering grades to be surfaced with local materials and the construction of permanent culverts and bridges. Orange County voted in 1911 for $100,000 for State Highway bridges, and

the sum of $225,000 of the 1908 Sacramento County bond issue was in the main applied on bridge work on State Highway routes.

So far as paved highways are concerned those counties which, either by direct tax or by bonding, have built permanent roads are treated hereafter at some length. Marin County and Solano County, which have built by other than bonding methods are now contemplating bond issues, as are Butte and Colusa counties, while Humboldt has started preliminary work in this respect and San Luis Obispo County, where a bond issue was defeated by a few votes in the fall of 1919, is, as the Missourian says, "rearing to go" again.

So far as the total road mileage of California state and counties is concerned the tabulation presented is scarcely more than approximate, yet, where direct information has been unobtainable from any particular county, data supplied by the State Board of Agriculture have been used, so the total paved road mileage and total mileage of all county roads chronicled may be regarded as about as accurate as can possibly be arrived at.

County	Miles Paved County	Miles Paved State	Total Paved Mileage County and State	Total County Road Mileage Paved and Unpaved
Alameda	52.19	54.48	106.67	533.00
Alpine	.....	.....	.....	200.00
Amador	.....	.....	.....	580.00
Butte	15.00	52.14	67.14	1400.00
Calaveras	.....	.....	.....	600.00
Colusa	.....	42.46	42.46	1169.00
Contra Costa	155.91	20.57	176.48	700.00
Del Norte	.....	.....	.....	125.00
El Dorado	.....	22.10	22.10	900.00
Fresno	315.50	33.83	349.33	5000.00
Glenn	.....	25.93	25.93	1368.00
Humboldt	10.00	12.26	22.26	1348.00
	548.60	263.77	812.37	13923.00

County	Miles Paved County	Miles Paved State	Total Paved Mileage County and State	Total County Road Mileage Paved and Unpaved
Carried forward..	548.60	263.77	812.37	13923.00
Imperial.....	.....	47.76	47.76	1000.00
Inyo.....	.....	8.56	8.56	923.00
Kern.....	230.07	72.62	302.69	2180.00
Kings.....	103.79	9.01	112.80	600.00
Lake.....	.....	.....	.....	700.00
Lassen.....	.....	.....	.....	1700.00
Los Angeles.....	601.50	177.96	779.46	3500.00
Madera.....	.....	27.90	27.90	1250.00
Marin.....	54.00	22.86	76.86	400.00
Mariposa.....	.....	.....	.....	500.00
Mendocino.....	.....	11.80	11.80	800.00
Merced.....	107.50	49.56	157.06	1218.00
Modoc.....	.....	.....	.....	650.00
Mono.....	.....	.....	.....	425.00
Monterey.....	81.00	94.64	175.64	2070.00
Napa.....	31.00	15.45	46.45	560.00
Nevada.....	.....	3.04	3.04	800.00
Orange.....	163.90	43.01	206.91	615.00
Placer.....	.....	34.62	34.62	1200.00
Plumas.....	.....	.....	.....	550.00
Riverside.....	140.56	19.66	160.22	1714.00
Sacramento.....	150.00	59.38	209.38	1419.00
San Benito.....	.....	16.76	16.76	468.00
San Bernardino...	220.38	48.87	269.25	4331.00
San Diego.....	155.00	68.11	223.11	5000.00
San Francisco.....	20.00	.....	20.00	200.00
San Joaquin.....	321.70	60.30	382.00	1350.00
San Luis Obispo..	.....	58.73	58.73	1353.00
San Mateo.....	150.00	20.15	170.15	284.00
Santa Barbara....	108.00	74.29	182.29	1143.00
Santa Clara.....	97.30	63.32	160.62	1200.00
Santa Cruz.....	39.10	9.89	48.99	450.00
	3323.40	1382.02	4705.42	54296.00

County	Miles Paved County	Miles Paved State	Total Paved Mileage County and State	Total County Road Mileage Paved and Unpaved
Carried forward..	3323.40	1382.02	4705.42	54296.00
Shasta.....	.....	.....	.....	1800.00
Sierra.....	.....	.....	.....	379.00
Siskiyou.....	.....	.....	.....	1400.00
Solano.....	25.00	47.24	72.24	700.00
Sonoma.....	93.40	33.18	126.58	2000.00
Stanislaus.....	131.00	48.82	179.82	1200.00
Sutter.....	87.50	11.70	99.20	400.00
Tehama.....	.....	29.91	29.91	750.00
Trinity.....	.....	.....	.....	400.00
Tulare.....	220.00	61.27	281.27	3600.00
Tuolumne.....	.....	.....	.....	868.00
Ventura.....	144.50	42.94	187.44	554.00
Yolo.....	75.00	36.92	111.92	800.00
Yuba.....	.....	12.50	12.50	600.00
Total.....	4099.80	1706.50	5806.30	69747.00

In supplying an estimate of the paved road mileage of the state all types of paving, concrete, surfaced and unsurfaced, oil macadam, and asphaltic construction—have been included under the head of paved roads, owing to the fact that it approximates the impossible to go into such detail as would be necessary to segregate the different types, the mileage of paved roads voted and otherwise provided for being comprehended even though construction work has just begun.

In this connection it may be said that only a very few counties in California have adopted any other type of paving than the concrete base for county-wide highway systems built under bond issues, these being Sacramento County, under the 1908 bond issue, San Joaquin, Kings, and Monterey, with perhaps Los Angeles properly included, as the major part of the system voted for in that county in 1909 was of oil macadam.

With these exceptions all the counties have put down or are planning concrete, except in outlying districts where travel is too light in character to justify expensive pavement, these outlying roads sometimes being surfaced with local materials and sometimes being of oil or asphaltic construction, the widespread adoption of concrete resulting no doubt from the advice of the engineers of the United States Bureau of Public Roads and the California Highway Commission, who have declared that the concrete base alone supplies that element of permanency which is the only justification for borrowing money over long periods of time for road construction—common sense dictating the necessity of supplying a type of pavement which will last under economical maintenance until the money borrowed is paid back and county credit once again restored.

So it may be said that the California standard pavement for both state and county work is the concrete base. In some instances this base is left unsurfaced until such a time as it begins to show wear, but the general practice is to put on some protective covering promptly in order to guard against that wear and tear supplied by steel-shod traffic which will continue until the horse and wagon become adjuncts of museums instead of wayfarers upon the highway.

In protecting their roads engineers throughout California have adopted many different kinds of surfacing, in the main following State Highway specifications, although some have put on one or the other of the different patented tops, some of which, it may be said, are excellent and supply a greater factor of safety than that of the State Highway, by reason of the fact that they are not so prone to become "skiddy" in wet weather.

In touching upon the work done by counties in the extension of the California Highway system it is only fair to mention the undertaking of the Natomas Company of California, a corporation engaged in reclaiming thousands upon thousands of acres of rich bottom lands along the Sacramento River. To supply those who have bought land and are producing huge tonnages of agricultural products,

this company has built a concrete highway thirteen miles in length, fifteen feet in width, on top of the protecting levee along the Sacramento River, with side roads leading down into the agricultural districts and here and there a roadway giving access to some pleasant camping place along the river bank—this road being put in under the direction of Mr. Emory Oliver, the general manager, who believed that, while no specific promise was made to purchasers, it was the part of sound judgment to supply them with a modern road over which they might economically haul their crops to market or shipping point.

In addition to being commercially needed this road supplies one of the most attractive drives radiating from Sacramento and is, in time, to be extended by Sacramento County to the Sutter County line, where a connection is already provided for under the bond issue passed in that county.

In the succeeding chapters the accomplishments of California's counties are chronicled at length, the co-operation of the Boards of Supervisors, Chambers of Commerce, and Boards of Trade of the counties described making possible the compilation and publication of this volume.

CHAPTER XX

ALAMEDA COUNTY

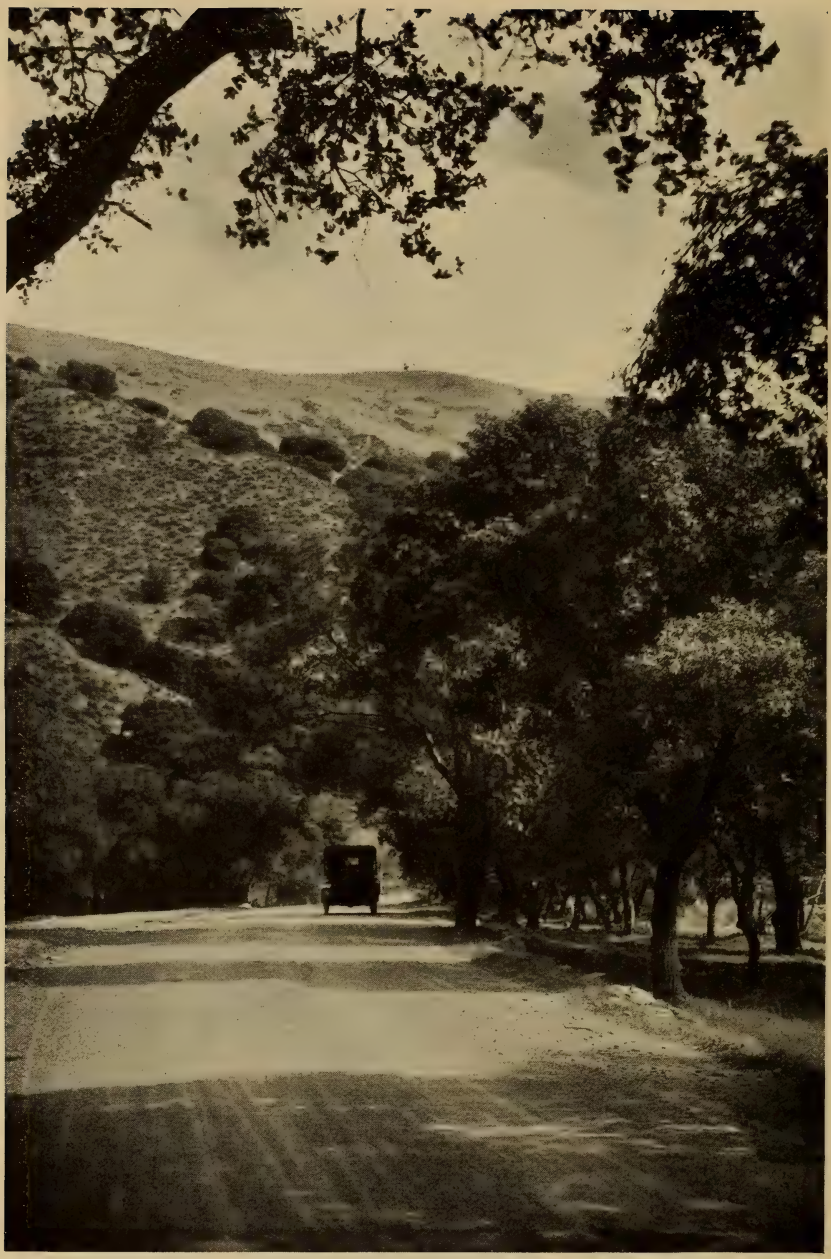
THE road problems of Alameda County are comparatively simple, owing to the fact that the widespread city limits of Oakland, Alameda, and Berkeley, the three principal cities, relieve the county of many miles of road which, paved by the cities named, none the less join in making up a county-wide system of highways, one of which, the "Skyline Boulevard," constitutes one of the most spectacular drives in California, if not in the United States.

With a comparatively limited road mileage, which in main-traveled highways amounts to only three hundred thirty miles, it may be seen that current funds supply all the money needed for road improvement, the financial condition of this county being excellent, with an assessed valuation of more than $300,000,000 and no bonded debt.

Including the State Highway, which supplies an east and west trunk line from Oakland to the San Joaquin County line by way of Hayward, at which point another route of the State Highway diverges reaching San Jose, in Santa Clara County, passing through Niles and by the old Mission San Jose, the paved roads of the county in the latter part of 1919 showed an extent of 106.67 miles.

With centers of population of the size of Oakland and San Francisco so close at hand it will be seen at once that a road tonnage of more than ordinary proportions must be provided for, and to meet this need the Alameda County Board of Supervisors, made up of John F. Mullins, chairman, of Oakland; D. J. Murphy, Livermore; Charles W. Heyer, Hayward; Wm. J. Hamilton, Oakland; and R. C. Staats, Berkeley, has provided concrete highways five inches thick,

The tunnel connecting Alameda and Contra Costa counties, built by joint action of the Boards of Supervisors.



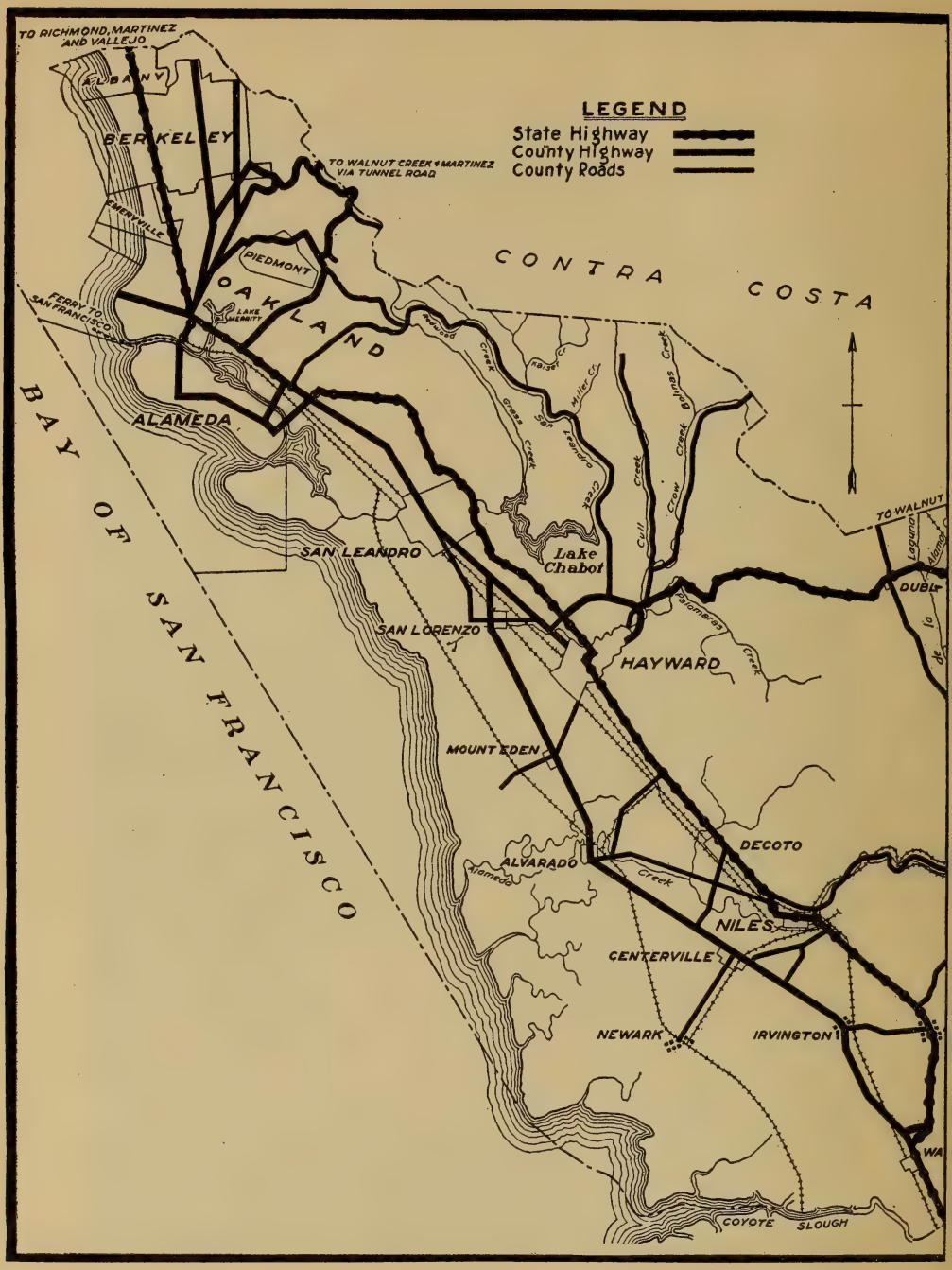
A stretch of Alameda County highway that carries a tremendous volume of touring traffic.

varying in width from eighteen to twenty-six feet, the engineers actively in charge of the work under the direction of the Board of Supervisors being P. A. Haviland, county surveyor, and his deputy, George A. Posey. There is comprehended in the road mileage given 52.19 miles of highway which, while in part built by the different cities is none the less to be regarded as properly a part of the County highway system.

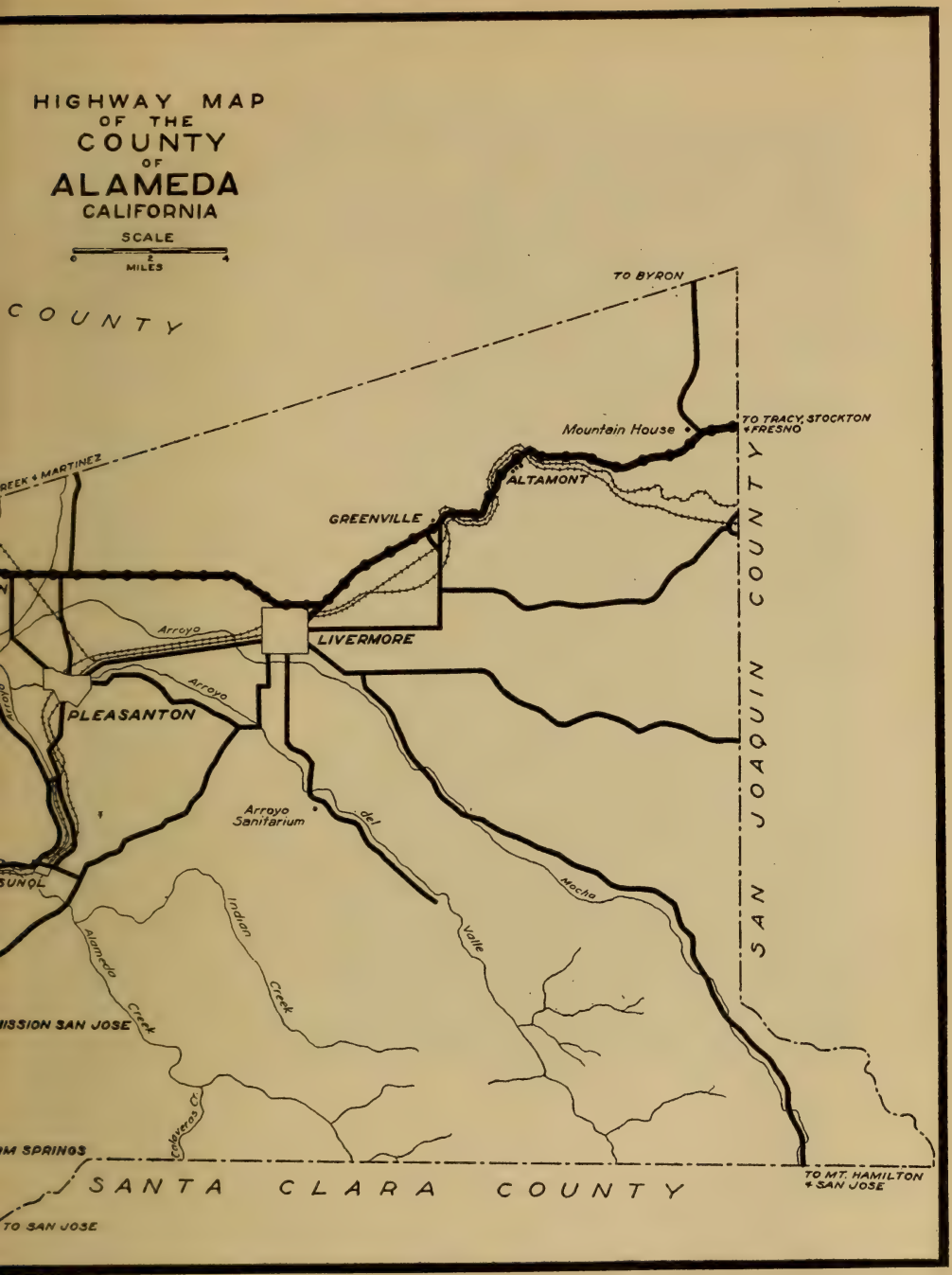
By far the most pleasant aspect of Alameda County's road system is that which comprehends its touring development, and here can be found ample excuse for enthusiasm in contemplating the work done in developing what is commonly known as the "Skyline Boulevard," a short tour which passes the beautiful expanse of Lake Merritt, in the very heart of the city of Oakland, and climbs upward to the high crest of the Berkeley Hills, from which point one of the amazing views of California is to be had. Far below, the cities of Oakland, Berkeley, and Alameda lose their identity and mingle into a wide expanse of buildings so microscopic in size as to suggest something like Fairyland, while to the south the lower reaches of San Francisco Bay merge into the marshlands of Santa Clara County.

Across San Francisco Bay, and over the top of San Francisco, perched on its hills as it is, the wide expanse of the Pacific ends in a horizon where sea and sky blend imperceptibly beyond the Golden Gate, where the bluff-like shores of San Francisco County and Marin wall in a narrow way that leads from the Pacific into one of the finest land-locked harbors in the world. On the smooth expanse of bay lie Goat Island, beloved of the Navy; Angel Island, where quarantine and immigrant detention stations exist; and Alcatraz, suggesting in contour some gigantic battleship lying flat athwart the entrance to the Golden Gate as if awaiting to challenge the ships that come sailing in.

To the northward the lift of Mount Tamalpais rises above the peaked hills of Marin County, while in the sweep of shore which is disclosed may be seen glimpses of San Pablo Bay. To the eastward from this road, when it swings around tips



Alameda County by reason of its wealth has been enabled to put down a satisfactory highway mileage without resorting to bonding.



The State Highway shown is that which carries the burden of traffic from the San Joaquin Valley to San Francisco.

Looking down over Oakland from the Berkeley Hills. Highway shown is approach to Skyline Boulevard.

So young is the State of California that Californians perhaps are more than ordinarily possessed of the impatience of youth, demanding a road development that has not even been reached in the hundred-year-older East, but in making a résumé of the road-building accomplishments of Alameda County it may be said that great strides have been made and greater plans are in the making for a road system that will supply not only the commercial needs of the county but also a series of matchless scenic boulevards. In the development of these the 1919 Oakland Chamber of Commerce, of which H. C. Capwell is president, J. R. Millar and George A. Armes, vice-presidents, and Joseph E. Caine, secretary and managing director, has taken an active part through its Good Roads Committee, which is made up of H. O. Knudsen of Oakland, chairman; F. V. Jones of Niles, vice-chairman; and Charles R. Avis, Charles E. Cornell, F. A. Costello, Hugh P. Evans, Dr. C. F. Jarvis, F. E. Kidder, A. J. Kleimeyer, R. W. Martland, R. J. McMullen, H. G. McMillan, C. B. Mersireau, Hugo Muller, A. C. Ostrom, Arthur Ramage, J. B. Racine, G. C. Reinkens, Theo Schlueter, D. J. Senclair, C. A. Spears, and V. K. Sturges, all Oakland business men.

With these men working in conjunction with the Alameda County Board of Supervisors, and their engineers, the road future of this county is amply safe from the standpoints of both sound administration of finances and the development of a road system of such magnitude as Alameda County should have, and there is no question that around Alameda County in the future an area of close-in drives will be developed which for proximity to large centers of population and scenic attractiveness will match any similar area in the United States.

CHAPTER XXI

CONTRA COSTA COUNTY

In 1915, Contra Costa County adopted the plan of building roads by direct tax, and with the beginning of 1919 had improved forty-eight miles of its highways with exceptionally good pavement, eighteen feet wide and five inches thick, carrying its road-building enterprises forward even in 1918 when practically every other county had been forced to stop. Long prior to starting its road paving, however, this county had evidenced a desire for better highway conditions by undertaking the construction of a tunnel under the Berkeley Hills which would supply a direct connection between Contra Costa County points and the thickly populated section around San Francisco Bay. In this tunnel enterprise the co-operation of Alameda County was had, and by no small expenditure of funds the two counties eliminated a road of arduous grades and made possible an easy way into Contra Costa County and to Sacramento Valley points by way of the Martinez-Benicia ferry.

Immediately following this accomplishment real road building at once began and for some years the people of Contra Costa County "pointed with pride" to their road-building accomplishments, but finally, in the spring of 1919, awakened to the fact that after five years of road-building they only had forty-eight miles of paved highway. Immediately a sentiment began to grow for another bond issue, one having been tried before and failed. And in June, 1919, after developing what seemed to them a sound, wise, and economical plan, the Board of Supervisors, made up of J. H. Trythall, chairman, Antioch; Zeb Knott, Richmond; J. P. Casey, Port Costa; Vincent Hook, Concord; and W. J.

In the San Ramon Valley. This stretch is to be paved with concrete and the beautiful oak tree shown is to be preserved.

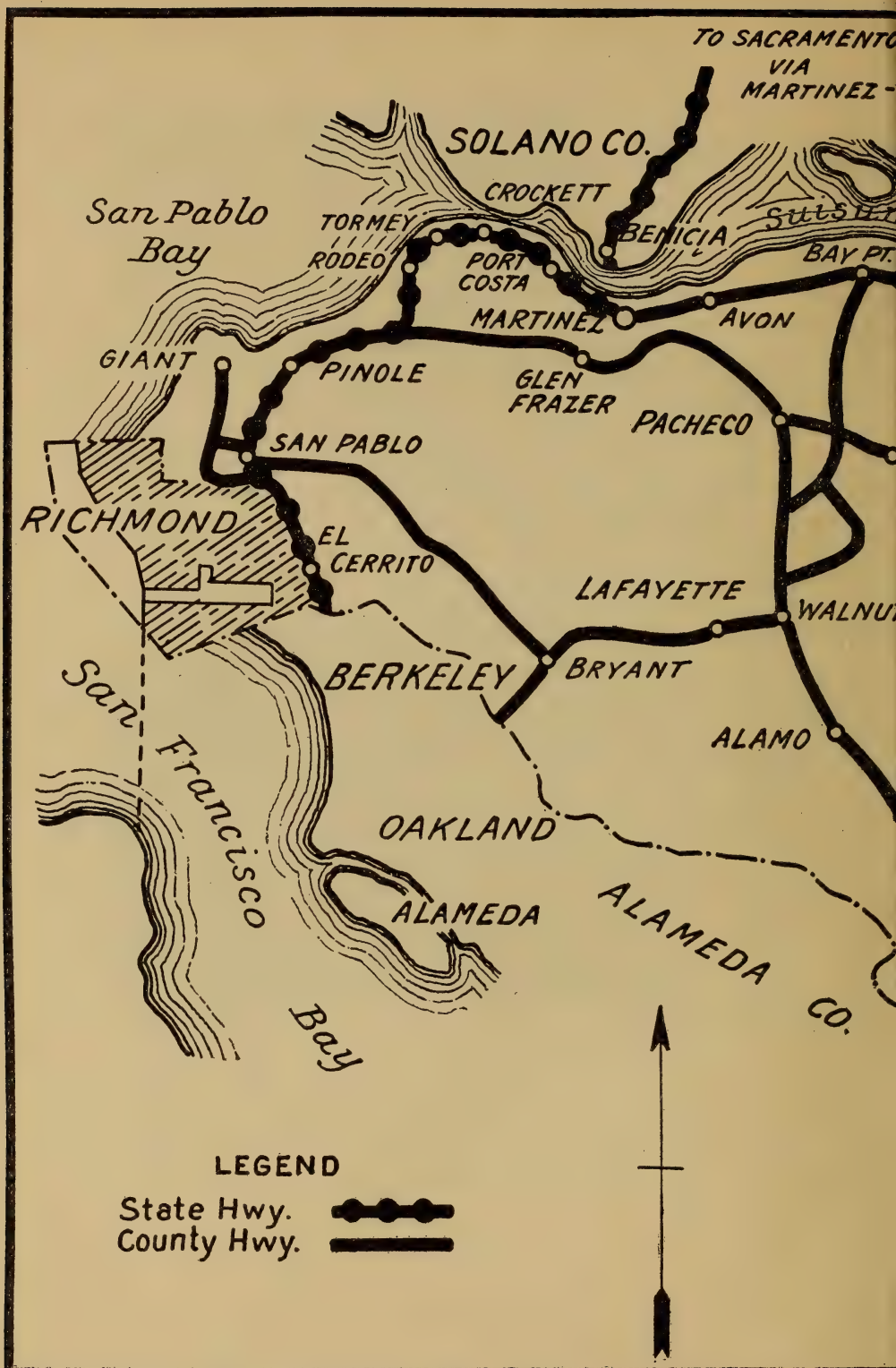
Contra Costa County builds 18 foot roads and the clearance supplied is well shown in this picture.

Buchanan, Pittsburg, called a meeting of the people of the county and set July 22 as the date for an election proposing $2,600,000 for paved highways.

The road plan adopted provided for seventy-two and ninety-one hundredths miles of concrete roads eighteen feet wide and five inches thick, together with thirty-five miles of asphaltic construction on roads which did not carry sufficient travel to justify a more expensive pavement, these roads being of the same width and thickness as the concrete highways.

In so far as the road routing of the highways proposed was concerned the general plan was to connect up those links already laid down by direct tax into a comprehensive county system which would connect at Martinez, the county seat, with the through line of the State Highway and no sooner was the plan made public than a very general sentiment appeared throughout the county which resulted in the formation of the Contra Costa County Good Roads League, with George O. Meese, county auditor, as chairman; J. F. Brooks, vice-chairman; J. Rio Baker, treasurer; Will R. Sharkey, chairman of the finance committee; and Clark T. Farnham, secretary of the Martinez Chamber of Commerce, secretary.

The purpose of this organization was to put the bond issue across and thus to secure a more rapid road development than was possible by direct tax, each supervisorial district in the county being provided with a definite campaign committee to see that things went well on election day. This committee, in supervisorial district one, was made up of Harry Pulse, as chairman, with the following members: Fred Heckman, Mrs. W. A. Boone, Mrs. K. L. Monroe, Ed. Garrard, W. T. Helms, J. F. Galvin, and Supervisor Zeb Knott, all of Richmond; James Silvas, Pinole; John Monroe, Selby; and Kerk Gray, El Cerrito. George Wall of the Richmond Improvement Association; J. O. Ford, city tax collector of Richmond; and J. F. Ballinger of the Mechanics Bank were other Richmond citizens who volunteered and did good work.



Contra Costa County after building nearly 50 miles of concrete roads by direct tax voted a big bond issue and is developing one of the best county systems in the state.

The stretch of road reaching toward the San Joaquin County line from just above Byron connects with the Borden Highway and will supply a short cut to Stockton.

In district two, C. H. Smith of Crockett was chairman of the committee comprising Theo. Nissen, Tassajara; J. C. Jones, Alamo; A. J. Tavan, Martinez; and Mrs. Charles Dodge, Crockett. While in district three, A. S. Ormsby, one of the original Contra Costa County road boosters, was chairman; E. A. Smith, Joseph Williams, Joseph Boyd of Concord, and Mrs. Harry Spencer of Walnut Creek making up the committee.

In district four, D. S. Sirdevan of Bay Point was charged with leadership; C. D. Johnson, Bay Point; George Kennerley, Antioch; Harry Keller, Clayton; and George Oliver, Pittsburg, making up his committee. The chairman in district five was Volney Taylor of Byron, his committee being Wm. Williamson, Antioch; W. Fotheringham, Knightsen; A. Van Kalhoven, Oakley; and Robert Wallace, Brentwood.

In the development of the bonding plan up to its crystallization in a call for a bond election, the Martinez Chamber of Commerce played a continuing and active part, the officers of this organization being Ralph H. Wight, president; Frank A. Tyler, vice-president; Frank L. Glass, treasurer; the board of directors being R. H. Bender, E. R. Colvin, A. E. Dunkel, George Dupen, J. W. McClellan, J. H. Morrow, W. E. Morton, N. J. Nulty, A. S. Ormsby, Don C. Ray, F. H. Roberts, and T. B. Swift, while actively assisting them was Mr. Warren H. McBryde, of Crockett, formerly a member of the Board of Supervisors and at one time president of the Contra Costa County Good Roads League, long a power and force in the movement for good roads.

In reviewing the campaign for a good roads bond issue of $2,600,000 in a county that had previously defeated a bond issue and thereafter built by direct tax forty-eight miles of highly creditable paved highways, and that had been popularly supposed throughout California to be successfully engaged in proving the pay-as-you-go idea as opposed to bonds, it is interesting to find a declaration that continuance of the direct tax rate method would involve a tax rate of seventy-six cents upon the one hundred dollars of assessed

On the Tunnel road between Walnut Creek and Oakland. Concrete highway built by direct tax by Contra Costa County's Supervisors.

Good roads have brought good schools to Contra Costa County.

Two eight-foot slabs of concrete with four feet of oil macadam between. An experiment being tried out in Contra Costa County.

valuation, while under the bonding plan, should the county not increase one cent in value in twenty-seven years, the life of the bonds, the average tax rate would only be thirty cents on one hundred dollars of assessed valuation, and that, under the normal increase of tax value, would amount to only nineteen cents. In addition to this widely presented argument the fact that five years of direct tax road building had only produced forty-eight miles of road served to swing sentiment toward the bond issue, which passed on July 22 by a majority of more than fifteen to one, thus ensuring this county one of the best road systems in California, for all the paved highways are to be at least eighteen feet wide and five inches thick, while the man who will build them is Ralph R. Arnold, county surveyor, who built the forty-eight miles laid down by direct taxation, has had the experience derived therefrom to guide him in constructing the splendid system proposed, and is one of the best-posted concrete road-builders in the state.

Upon reference to the accompanying map the road plan of the county may be seen and in its development there is supplied a link in a direct connection between the lower Sacramento and the upper San Joaquin valley with San Francisco Bay, now commonly called the Borden Highway, which originates at Stockton, passes through a tip of Alameda County and leads, by way of Antioch, Pittsburg, and Martinez, to San Francisco, over a route that should, in time, become one of the most popular avenues to central California valley points.

With the establishment of a road system such as Contra Costa County now has in the making, it is only natural to infer that a commercial need therefor exists, which is impressively so, as this county, in its western end, for miles has deep water frontage upon which some of California's biggest manufacturing establishments have been located, while in the interior, acres upon acres produce walnuts, almonds, deciduous fruits, and grain of all sorts in such abundance as to insistently demand good roads and eventually require a greater mileage than is now planned.

CHAPTER XXII

FRESNO COUNTY

FRESNO COUNTY, comprising within its boundaries 5950 square miles, ranks sixth in size among the counties of the state. Situated in the exact center of the great San Joaquin Valley and of the state of California, it lies between the Sierras to the east and the Coast Range to the west, is one of the most productive counties in the state, and has more than five thousand miles of roads.

In dealing with road problems in the past the various Boards of Supervisors in charge of county affairs pursued the plan of applying oil to the earth roads and secured fairly comfortable highways so far as light travel was concerned, the roads being free from dust in the summer and passable at all times, the expense involved, however, being very great, with nothing of permanent result achieved.

In so far as heavy hauling was concerned, however, the oiled roads of Fresno County failed to meet that need which was born from an almost phenomenal agricultural development, and so it was that in 1916 a county-wide road system was laid out and a bond campaign undertaken, which, however, failed to carry.

Not in the least disheartened by this defeat, in 1918 the Fresno County Board of Supervisors, made up of Chris Jorgensen of Fresno, chairman; Robert Lochead, Fresno; J. B. Johnson, Fresno; Charles Wells, Selma; and W. A. Collins, Sanger, called upon the United States Office of Public Roads for advice and proceeded to lay out a road system such as they thought their county needed. The plan developed provided for a bond issue of $4,800,000, the largest bond issue ever attempted by any California County for good

Fresno County has many hundreds of miles of oiled roads.

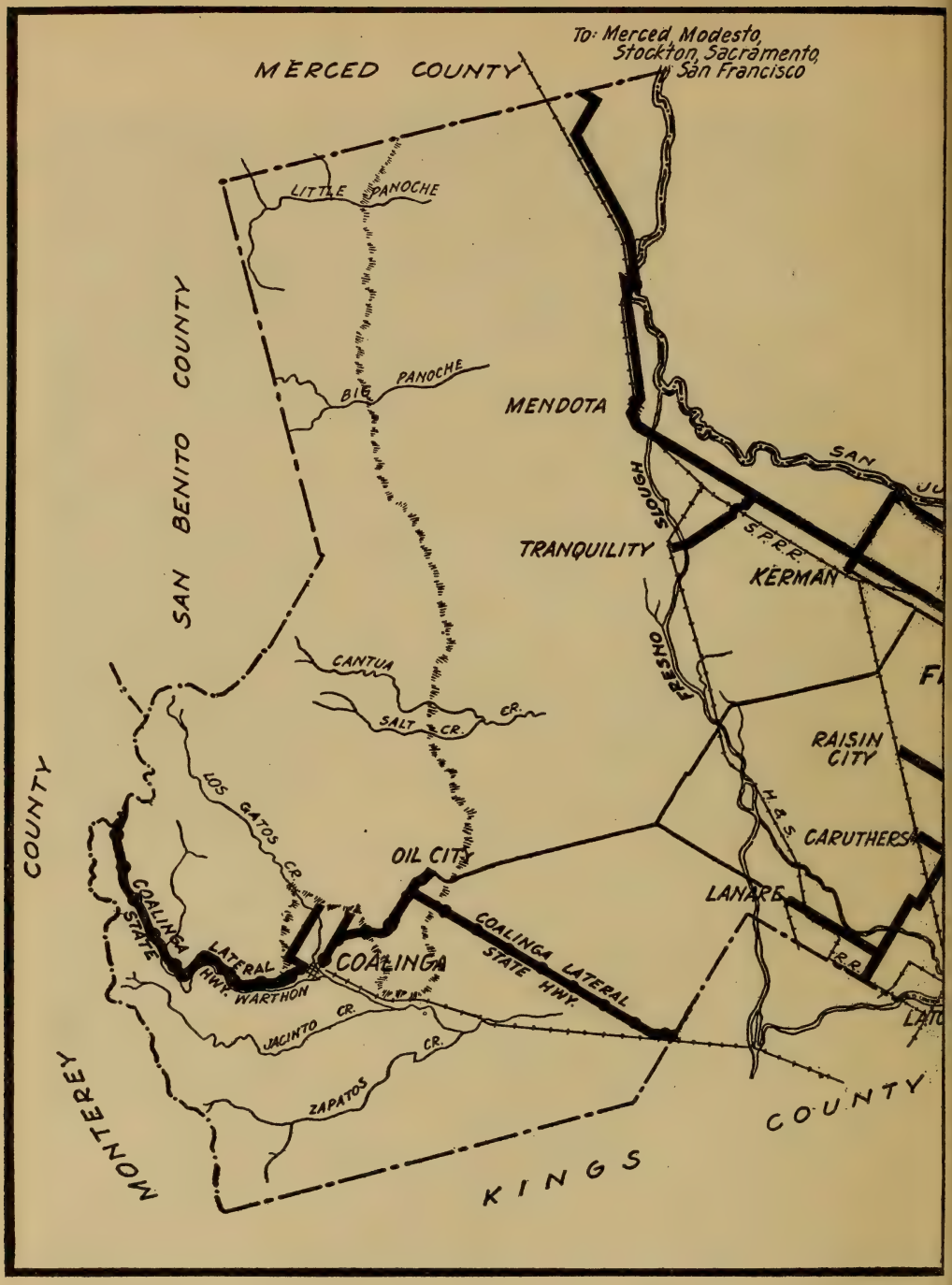
One of Fresno County's oiled roads which are being supplanted by permanent pavement.

roads, the system outlined comprehending a total of 315.50 miles of highway, which will be built under direction of County Surveyor Chris P. Jensen.

The various elements combining to make up a road tonnage of sufficient volume to justify the investment of $4,800,000 of public funds in paved highways are interesting, affording as they do a glimpse at the wonderful productivity of Fresno County's soil, this county having been, since 1893, the raisin-producing center of the world, a responsibility which before that time had rested upon Spain. In the handling of this crop, which in 1918 approximated 165,000 tons, every pound went from point of production to packing or shipping place over the county's roads and supplied, without further reason almost, justification for a road plan of the high type and expense involved.

In addition to the raisin tonnage, however, about 200,000 tons of alfalfa are yearly produced in Fresno County, while 20,000 tons of fresh grapes, easily marred and depreciated in value by hauling over bad roads, are marketed each year. Fresh and dried figs contribute an additional road burden of about 6000 tons, while peaches, apricots, plums, citrus fruits of various kinds, and berries, in constantly increasing production, supply more road traffic.

That a campaign was needed to carry a bond issue approximating $5,000,000 goes without saying, and the Fresno County Good Roads Association, with George S. Waterman of Fresno as president, William Glass of Fresno as vice-president, and C. N. Alexander as secretary, was organized for this purpose, the directors being Charles L. Adams, Burrel; John Braves, Fresno; B. C. Britton, Del Rey; P. K. Carnine, Fresno; Charles H. Cobb, Fresno; Z. L. Cornwell, Laton; R. W. Dallas, Coalinga; Mrs. W. A. Fitzgerald, Fresno; Levi Garrett, Kingsburg; Wylie M. Giffen, Fresno; George W. Hensley, Clovis; J. D. Hershler, Reedley; Ernest Hoskins, Auberry; F. L. Irwin, Fresno; J. A. Johnson, Kerman; W. F. Jones, Sanger; Frank B. Marks, Dos Palos; H. E. McLane, Coalinga; L. A. Nares, Fresno; George Ohannesian, Fresno; H. E. Patterson, Fresno; C. V. Peterson, Fowler;



Fresno County has received little so far from the state, the Coalinga Lateral being under construction in the latter part of 1919 in a small part of its length.

The system of county highways shown is that voted for in May, 1919, which is now under construction. That portion of the county system passing through Kerman and Mendota will in conjunction with roads of Merced, Stanislaus and San Joaquin counties supply an alternative route to San Francisco.

Mrs. C. F. Reilly, Fresno; W. H. Say, Selma; and Sam B. Williams, Helm.

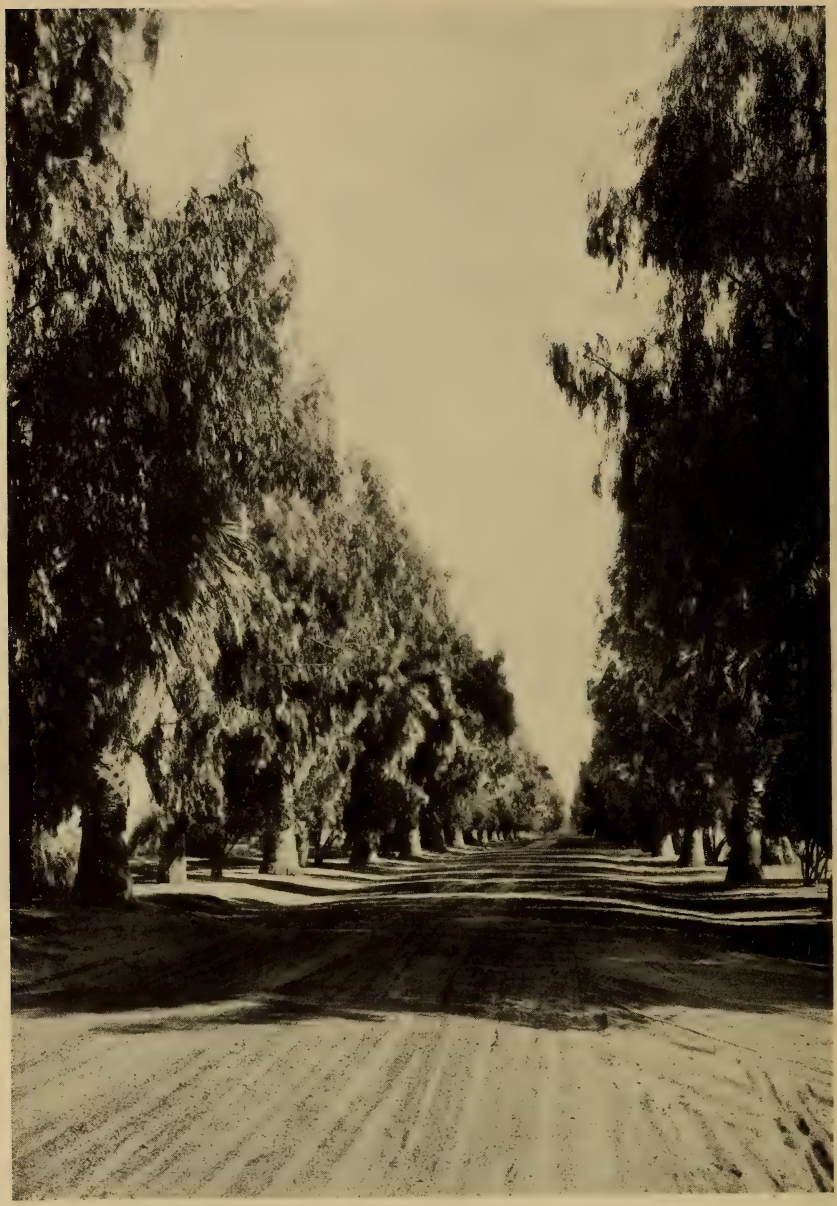
In addition to this organization the Fresno County Chamber of Commerce, with Wm. Glass, president, and H. E. Patterson, secretary, took an active part, as did practically every other organization throughout the county, every member of the Board of Supervisors campaigning actively for the success of the bond issue; the district around Coalinga giving a vote upon election day of three thousand four hundred and twenty-two for the bonds to only eleven against, a record which will stand for all time to come as evidence of a splendid public spirit and desire for general county progress.

In order to secure the advice of a representative body of citizens the Fresno County Board of Supervisors, shortly after the bond issue was passed, appointed an advisory committee made up of George S. Waterman, E. E. Manheim, H. H. Welch, E. J. Bullard, and Harvey Anderson, and this body of men has recommended that the system of highways now in the building shall be throughout of concrete unless in those more remote sections where a lesser type of construction will serve traffic needs.

Reference to the accompanying map will show the general plan and scope of the new Fresno County road system, of which perhaps the Fresno-Sanger-Reedley Road is the most important in point of tonnage served, while the line to Coalinga and the one reaching toward Dos Palos, in Merced County, are also of great value, the Coalinga connection supplying access to the State Highway lateral which reaches from Coalinga to the coast, the Dos Palos routing reaching the Pacheco Pass lateral which supplies a link in the famous Yosemite-to-the-Sea Highway.

Directly through the center of the county in a general north and south direction the main valley trunk line of the State Highway supplies a backbone to which the new Fresno County system is tied, serving to connect every point in Fresno County with the wonderful California highway system and bringing into Fresno County each year thousands

The character of tonnage Fresno County's highways bear.



Kearney Boulevard, Fresno County's most famous drive.

of tourists, no few of whom find that place of which they have dreamed and remain to further develop the county and produce yet more tonnage for its roads.

To contemplate the road situation in Fresno County from a purely commercial standpoint would be to do only half justice to the subject, for the geographical situation of Fresno County and the city of Fresno is such as to make it a natural distributing point for those tourists who come to California each year in such constantly increasing volume; who travel so widely throughout the state, and who enthuse so vastly over the extensive development of our state and county systems of roads.

Those automobile tourists traveling the State Highway find around Fresno a tremendous area of playground, in which, of course, that wonderland, the Yosemite, easily stands first in attraction; but only less attractive in small degree is a practically unknown area taking in General Grant National Park and culminating in the little-advertised glories of the Kings River canyon country, where Mount Brewer, rising nearly 14,000 feet towards the clouds, with its slate-colored pinnacles of solid granite making a serrated line against the sky, seems to tower above and dominate the entire landscape.

From the heights of Kearsarge Pass in this Kings River region the Owens River valley may be seen, with the miniature buildings of Independence, the county seat of Inyo County, making a tiny patch in the foreground, while the barren mountains which fringe Death Valley are also clearly in view. The Kearsarge pinnacles and lakes, Deer Horn Mountain, Mount Stanford, Mount Brewer, and the summits of the Kings-Kern divide are also plainly visible, this whole region comparing favorably with any other mountain region in California in point of scenic interest and being visited by few only because its manifold attractions have never been made known.

CHAPTER XXIII

KERN COUNTY

For many years Kern County was the kingdom of the stock raiser with immense herds grazing upon all sides, and cattle barons lords of all they surveyed, this era being followed by an agricultural development of thousand-acre wheat fields which continued for years.

Then came the discovery of oil, the building of cities, irrigation, land subdivision, and then good roads, until today it might be justly said that a great and growing empire exists which yearly grows as irrigation is extended and as the few last large land holdings are cut up.

In location Kern County lies in the lower end of the San Joaquin Valley, the Coast Range rising to the west, the Tehachapi Mountains to the south, while to the eastward it extends over the extreme southerly end of the Sierra Nevadas into the Mojave Desert.

In the northeastern part at Randsburg is one of California's largest gold mines. On the west, lying along the slopes of the Coast Range, are the Sunset, Midway, McKittrick, and Lost Hill oil fields, while in between are many small acreages that produce prolific crops of many different kinds.

Apricots, peaches, pears, prunes, olives, figs, and oranges each year are grown and hauled to packing house or shipping point, while rice, various grain crops, forage crops, and cotton supply a road tonnage that grows with each year. In addition to this tonnage the heavy hauling incident to the development of the oil fields has imposed an extraordinary burden upon Kern County's roads, and if this county had not awakened to its road needs early in 1913, it is difficult to

Highway down from Tejon Pass into San Joaquin Valley. Grapevine Creek in left center, Seventeen-mile tangent in background.

Seventeen-mile tangent on State Highway looking toward Bakersfield. Trees are being planted along this stretch of highway through the co-operation of Kern County.

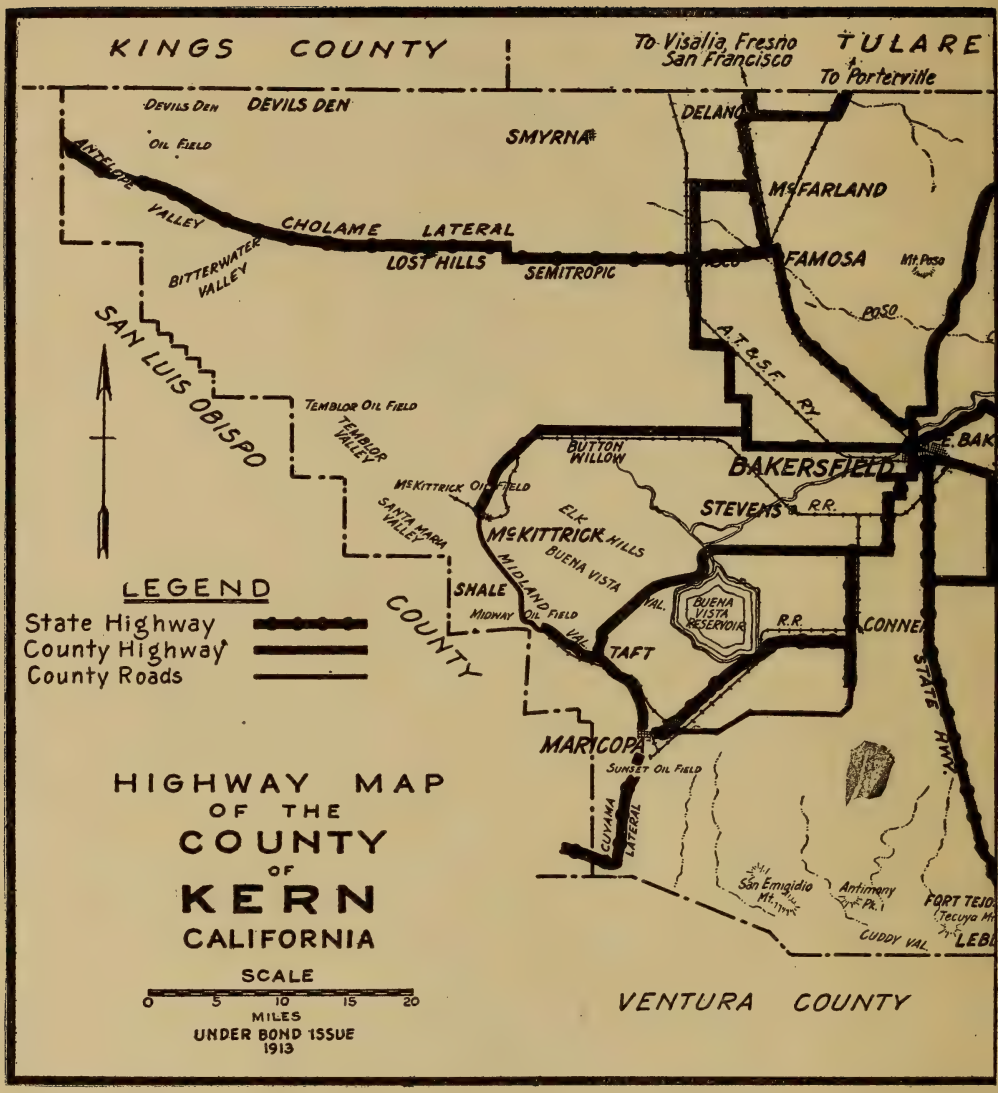
estimate what the result would have been in so far as general county development is concerned.

In the year named, Kern County made its start toward road development, being the sixth county in the state to vote bonds, the amount of the bond issue being $2,500,000, the total extent involved being three hundred and sixteen miles, of which 85.5 miles was planned for grading, leaving a paved road plan of 230.7 miles.

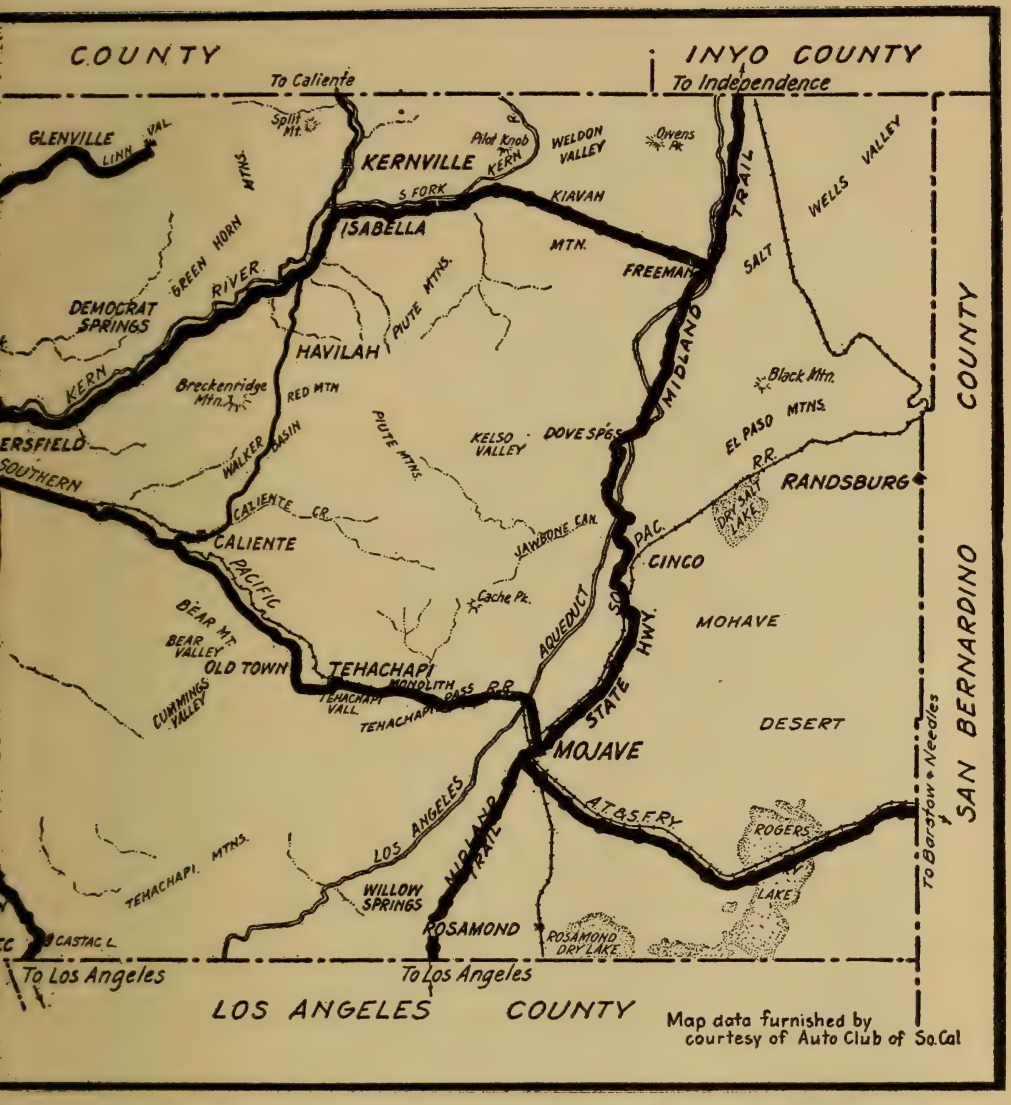
As will be seen from the accompanying map, these roads practically covered the entire county in plan and in the main they have been built, the fact that the entire system as planned has not been completed being due to those abnormal cost increases incident to war conditions which the Kern County good-roads enthusiasts could not possibly foresee when, in 1913, they voted upon a splendid system of highways for their county.

In 1913, good-roads campaigning was vastly different from present days when the economic value of the good road is so thoroughly established and so widely known as to make a good-roads bond issue merely a matter of adjusting county finances to the general county good-roads needs; and Kern County in the vernacular of that particular brand of Missourian which inhabits the remote places of the Ozarks, was forced to put up "a right smart fight."

In preparing for this battle the Kern County Board of Supervisors—H. A. Jastro, chairman; J. O. Hart, J. M. Bush, L. F. Brite, and Charles F. Bennett—appointed a Highway Commission made up of J. L. Evans, C. E. Getchel, and Allen J. Woody, the engineer being C. R. Sumner; and these men after surveying thoroughly the vastness of Kern County, for Kern County is just about the size of many respectably large Eastern states, developed the plan outlined in the accompanying map, submitted their report to the Board of Supervisors, who approved it and set the date for the bond issue, whereupon the good-roads forces assembled and a campaign army set forth upon its travels, actively interesting themselves being the following men: John L. Gill, W. E. Drury, T. W. McManus, Tom Burke, H. G.



As may be seen on this map Bakersfield forms the hub for several radiating State Highway routes. That reaching Mojave and extending into San Bernardino County is partly paved by the county and will be completed by the state. That portion of the Cholame Lateral adjacent to Bakersfield has been paved by the county and is as yet merely a state survey. The same is true of the Cuyama Lateral south from Maricopa.



The north and south State Highway route shown in eastern part of county is oftentimes designated as El Camino Sierra and is completed only in small portion while that proposed route tapping it at Freeman is in part completed by the county and forms a construction project of the state climbing over Walker Pass at the lower end of the Sierras.

Parsons, Captain Lucien Beer, J. W. Hicks, Lawrence Weill, Frank W. Cameron, C. A. Barlow, Fred H. Hall, Jo. P. Carroll, Adolph Jacobs, G. D. Willaman, and J. L. Swett.

The bond issue went across with a big majority, and road building started, war-time happenings preventing the carrying out in completion of the proposed plan, but none the less Kern County got a good start toward a comprehensive road system, such a good start that the Board of Supervisors of 1919, made up of H. I. Tupman, Stanley Abel, J. B. McFarland, J. I. Wagy, and H. C. Rambo, is extending the system as best it can out of current road funds, and is planning another bond issue not only to complete the originally planned system, but also to add some new roads made necessary by county development, and in their aspirations they have the co-operation of the Kern County Chamber of Commerce.

This organization, under the leadership of H. J. Brandt, of Bakersfield, its president, is concerning itself actively with all affairs that look toward the development of Kern County's many resources, C. A. Stiles, A. H. Swain and Ralph Agey being vice-presidents, while C. F. Johnson is secretary. With these men is an active Board of Directors, made up of E. W. Davies, E. E. Teagle, James A. Pauley, L. J. Kanstein, J. W. Wiley, O. S. Grant, Wallace Morgan, H. Morgan, J. W. McClimonds, C. A. Barlow, W. W. Kelly, Jos. Redlick, and C. W. Newberry, and the biggest undertaking which they are planning is the development of the existing Kern County road system into one of the most comprehensive county highway plans in the state, as well as the maintenance of the present roads which are subjected to extraordinary use.

In so far as the State Highway is concerned, Kern County is practically divided by the main San Joaquin Valley line which extends north and south, while from Famoso north of Bakersfield to the west the Cholame Pass lateral reaches into San Luis Obispo County connecting with the Coast Highway at Paso Robles. From Bakersfield west to the coast road at Santa Maria is the Cuyuma lateral, planned under the 1919 State Highway bond issue, these two roads

A splendid example of highway tree planting in Kern County.

Highway through the oil fields of Kern County.

forming much needed cross-country lines between valley and coast.

From Bakersfield to the north and east a new State Highway road is planned over Walker Pass, connecting with the East-of-the-Sierras Highway, which extends north and south through the eastern portion of the county, a new State Highway from Mojave on this road reaching over to the county line toward Barstow.

With these roads to be supplied by the state the future of Kern County, as it relates to highway development, is of wonderful interest, for not only are its commercial needs to be cared for, but also a great flood of tourist travel will center here, since in the eastern and northeastern portion of the county are some of the most wonderful scenic regions in the state, taking in the lower stretches of the Sierras, where many trout streams are to be found, the wonderful scenic section of the Kern River canyon, a region comparable favorably to the Yosemite in grandeur, while the General Grant National Park, lying at the county's border, is a region destined to be vastly better known.

In supplementing the state roads now under plan, Kern County has built mile upon mile of highway which will eventually become a part of the state system, and thus, while doing what work was needed for its own development, has taken a creditable part in California's endeavor to build the most comprehensive road system of any state in the Union.

In so far as type is concerned Kern County's Highways are of concrete, in the main 15 feet in width and generally follow State Highway Specifications, the plan being to leave them unsurfaced until such time as wear and tear makes a covering necessary.

CHAPTER XXIV

KINGS COUNTY

THIS little California county was one of the pioneer good-roads counties of the lower San Joaquin Valley, following in the steps of Kern County, and voted a $672,000 highway bond issue in 1915, building thereunder promptly and efficiently an asphaltic concrete highway system which, with certain funds supplied by direct tax and out of the annual road moneys of the county, approximated in total cost the sum of $800,000 and in extent about one hundred miles.

In topography Kings County is practically level in its entire area, and the roads built were planned to serve a commercial need, this county being one of the few where comparatively no money was required to be spent in purely touring roads.

In so far as the agricultural aspect of Kings County is concerned reference may be had to a late report of the California State Board of Agriculture, which says: "In the very heart of the great fertile valley of the San Joaquin lies Kings County, one of the smallest, one of the youngest, but one of the most fertile counties in the state. In the northern part of the county raisin grapes, peaches, apricots, and prunes thrive best. The bulk of these crops is dried or canned, the product being handled by conveniently located canneries and packing houses. These fruits alone net the growers well into the millions of dollars annually.

"Alfalfa growing, hogs, and dairying in Kings County make a combination which is hard to beat, as the county is recognized by the agricultural world as the home of pure-bred live stock. Creameries and cheese factories are so located as to be convenient to all dairying sections. On the

One of the smooth paved roads of Kings County.

Kings County roads carry a varied traffic.

shores of Tulare Lake a vast empire has been reclaimed and thousands of acres are farmed to wheat and barley by the use of modern machinery.

"Grain sorghums, sugar beets, honey, and many other products of the soil contribute to the wealth of this little San Joaquin Valley County, no inconsiderable part of the crop being cotton, of which in 1918 about twelve hundred acres of Egyptian long staple was picked. Most of the water for irrigation comes from Kings River, although the waters of Kaweah River have been utilized freely.

"No slight contribution to the ease and low cost of marketing farm products is the fine new highway system, which connects all the agricultural communities of the county."

Like the little boy who saves some choice morsel to the last, this report of the California State Board of Agriculture concludes its article on Kings County with a bit of commendation for its roads, and there is scarcely any doubt but that the rapid development achieved by Kings County in the last few years is due to the fine highway system which was bonded for in 1915 and which has enabled the farmers to market their crops with minimum expense.

In so far as the State Highway system is concerned in its relation to Kings County the San Joaquin Valley trunk line merely grazes the northeastern portion of the county, the lateral to Hanford, the county seat, leaving the main trunk line a little to the south of Goshen, in Tulare County, and serving to connect the Kings County highway system with the great system of state roads.

Connecting with this lateral, however, what is known as the Coalinga lateral of the State Highway ties up San Joaquin Valley points with the main coast route of the State Highway at San Lucas, in Monterey County, supplying a cross-country highway which will undoubtedly bear a heavy volume of traffic. So it it may be said that while Kings County is not directly touched by the main San Joaquin Valley line it will benefit very greatly through the completion of the Coalinga lateral, long delayed for lack of funds, which, under the 1919 State Highway bond issue, is assured.

Kings County has had very little help from the State Highway, only that stretch between Hanford and the Tulare County line being completed.

From Hanford west to the Fresno County line the State Highway shown is the Coalinga lateral which supplies a short cut between Valley and Coast.

This lateral opens up to the residents of the central San Joaquin Valley a direct way to the Monterey coast and in conjunction with the splendid road system of Tulare County supplies a direct line from the coast route to the wonders of Sequoia Park, which will undoubtedly measure up to the benefit of Hanford and Tulare County generally, for a flood of tourist traffic is undeniably destined to flow over this road.

In so far as the extent of the Kings County highway plan is concerned the system built under the 1915 bond issue, which was supplemented by other funds, covered 103.79 miles, the cost per mile being $8,080, the roads being fifteen feet wide and four inches thick; and in preparing for the bond issue the Kings County Board of Supervisors, made up at that time of A. F. Smith, J. O. McIntyre, E. R. Montgomery, Frank Blakeley, and J. M. McClellan, chairman, appointed a county highway commission composed of C. C. Spinks, chairman; R. A. Moore, and F. M. Frazer, the latter serving as secretary; their executive officer being Benn Duffield, the county surveyor, who attended to the practical details of the work.

The plan developed by these men was comprehensive, covering the county from center of population to center of population and connecting all with the State Highway by the lateral reaching Hanford, the county seat, the principal towns of the county, Lemoore, Armona, Grangeville, Corcoran, Hardwick, and Stratford all being directly connected with Hanford by the system finally decided upon.

In 1915, when the Kings County good-roads bond issue was voted, the fight for good roads was much more of a battle than in the year 1919, and the campaign made in this county in plan was one of the best ever advanced in the state, the Kings County Chamber of Commerce, with W. Bernstein, president; B. B. Price, secretary; and a board of directors made up of Frank Johnson, A. G. Robinson, R. A. Moore, J. W. Guiberson, and Joe D. Biddle, devoting its entire strength to campaigning for good roads, as did the Hanford Merchants' Association, of which G. W. Kelly was president, E. F. Newton, secretary, and Arthur E. Horlock, David

Looking into Kings County from the Fresno County line.

On a Kings County highway near Hanford.

Kings County's highways carry a huge tonnage of soil products. Orchard on one side of highway; on the other vineyard showing trays for drying raisins.

Murry, and A. J. Young, directors. Helping them was the entire Board of Supervisors, reinforced by the chairman of the Highway Commission, who is one of the most enthusiastic good-roads advocates in California today, and the vote resultant from the campaign made by these men recorded the fact that a tremendous majority of Kings County people wanted good roads.

In type the roads laid down were of asphaltic concrete of what is known as Topeka specification, composed of crushed rock or gravel and sand of different grades bound together with asphalt, much care being given to the subgrade and drainage, and a generally careful job was done by the Highway Commission.

In point of time Kings County also established a high standard in the building of its highways and set a mark for speedy construction which it is painful almost to contemplate in view of the difficulties existent in 1919 in relation to highway construction, so that the saying, "Kings County has good roads," which came into common use throughout that portion of the San Joaquin Valley, was justly earned.

In so far as maintenance is concerned the present Kings County Board of Supervisors, made up of A. F. Smith, A. H. Johnson, E. R. Montgomery, John W. Russell, and M. C. Carter, working through County Surveyor Roy May, is doing its part to keep the roads built under the 1915 bond issue in good condition and while they do not contend that their roads which cost but $8,000.00 per mile are equal, in point of permanency, to concrete highways costing vastly more, none the less are they proud of their highway system and are doing excellent work in keeping it in shape.

CHAPTER XXV

LOS ANGELES COUNTY

TWENTY-ONE years ago Los Angeles County began that road improvement which has become such a marked phase of its development, for in 1898 three hundred eighty-three miles of road were treated with oil, the oiling of earth roads at that time being regarded as about the last word in road improvement.

Since that time road building in this county has reached a development little short of marvelous, and in the latter part of 1919 601.50 miles of well paved highway built to carry commercial traffic exist in Los Angeles County, while three thousand, three hundred fifty miles of oiled dirt roads, intended in the main to serve light touring traffic, have been developed and are being maintained.

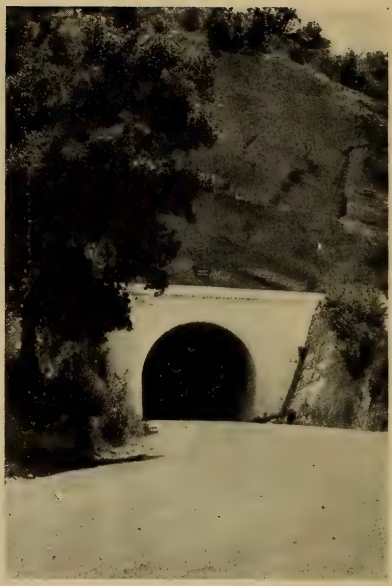
In addition to these county roads the city of Los Angeles, comprising in its area 363.44 square miles, has 511.86 miles of paved streets and 724.43 miles of streets graded and oiled, many of these oiled streets being nothing more nor less than country roads twenty miles away from the business district, for so wide-spread in dimension is this amazing California city as to comprehend within its limits those road problems which are peculiar to county rather than city government.

Eliminating the paved streets as properly to be credited to city rather than county accomplishment, it may be said that the oiled streets, while not legally a part of the county road system, may well be considered as part thereof, giving an oiled-road mileage of 4074.43 and a total improved road mileage, taking in six hundred miles of paved roads, of 4674.43, which is little short of amazing.

In securing this great highway development Los Angeles

Colorado Street Bridge over Arroyo Seco in Los Angeles County, one of the most beautiful bridges in the state.

Fremont Pass.



Newhall Tunnel.

Topango Canyon road.

Cahuenga Pass.

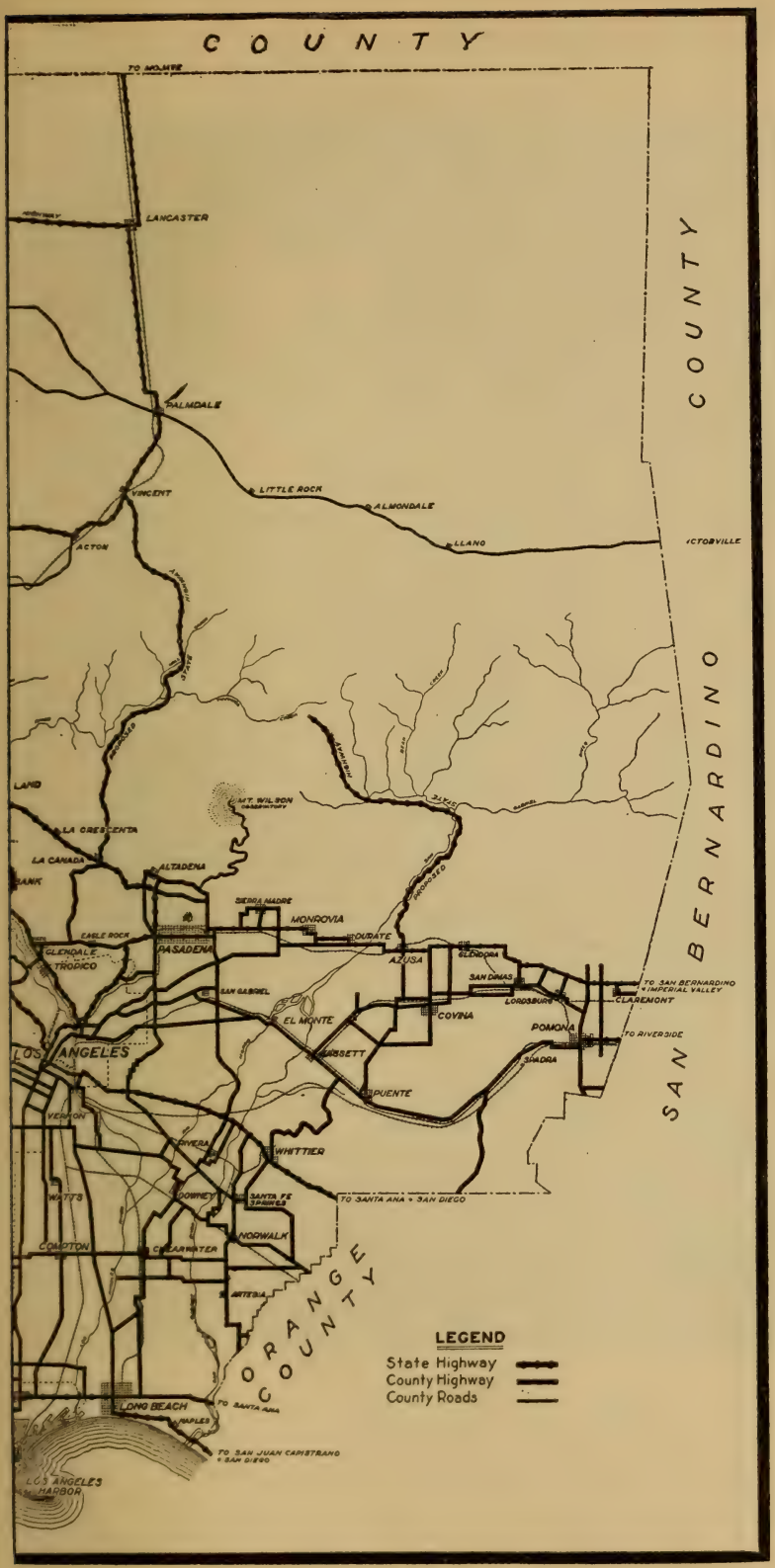
County voted a road bond issue of $3,500,000 in 1909, being the second county in the state to undertake such an enterprise and put down, under that bond issue, three hundred seven miles of oil-bound macadam roads, the concrete road at that time being an unknown quantity in California, these oil macadam roads being twenty feet wide in the main and five inches thick.

Of the present system of paved roads five hundred twenty-three miles are of the type just mentioned, while seventy-eight and one-half miles are of the best type of concrete construction, twenty feet wide and five inches thick, surfaced with asphaltic oil and screenings to take up the wear and tear of heavy travel, the present tendency being to construct concrete highways wherever heavy traffic exists, a highway now contemplated for improvement by the Los Angeles County Board of Supervisors, the Harbor Truck Boulevard, extending from the commercial center of Los Angeles to the harbor at San Pedro, setting a new standard for heavy-duty roads.

This highway, intended to carry an enormous tonnage, if expressed plans are carried out, to be forty feet wide, of a thickness of eight inches of concrete laid upon a well-rolled and compacted subgrade of disintegrated granite from six to eight inches thick, and covers a distance, outside of the city limits of Los Angeles and Vernon, of 13.32 miles. Inside the city limits of the places named about seven miles of pavement already exists, not of the type planned it is true, but none the less paved and required to be maintained no matter how huge the volume of traffic may become.

Other roads which, although serving a commercial traffic to some extent, bear that tremendous flood of automobile tourist traffic which centers around Los Angeles, are the Long Beach Boulevard and the Pico Boulevard, which reaches from the heart of the city of Los Angeles to Venice, Santa Monica, Ocean Park, and other beach resorts. Of the oil-bound macadam roads, intended in the main for pleasurable touring traffic, the Topango Canyon road perhaps stands foremost in scenic attraction, supplying as it

Los Angeles County has the greatest paved road mileage of any County in California and is constantly adding to it.



More lines of the State Highway center in Los Angeles County than in any other County.

does a link in a short tour originating in Los Angeles and thence, by way of Venice, Santa Monica, and Oceanside, leading up the coast past medieval-looking moving-picture establishments to where a rugged gash in the mountains opens Topango Canyon to the sea.

The Cahuenga Pass road also is attractive, although in different and less degree, and is much traveled both by pleasure and commercial traffic, as it supplies access to Los Angeles for the converged travel of both coast and valley routes of the State Highway.

In discussing the road-building accomplishments of a county such as Los Angeles in an article so limited in length as the present one only extraordinary undertakings are susceptible of mention, and of these perhaps the construction of the Newhall Tunnel is the most interesting. This tunnel, built by Los Angeles County, was presented to the State Highway, and through it pours that ever-increasing flood of travel which comes from the Sacramento and San Joaquin valleys by way of the Tejon-Castaic Ridge State Highway route. Before the building of this tunnel and in the days when there was no State Highway Ridge route access into Southern California was had by way of Fremont Pass, a sheer cut eighty feet deep through conglomerate rock with grades of twenty-nine per cent, so narrow that only one vehicle could pass through at a time and so steep-sided that now and then a boulder dropped from the wall upon some unfortunate traveler. Access to Fremont Pass was had from the north by way of Antelope Valley and Boquet Canyon, and the pass takes its name because of the popular declaration that General John C. Fremont in his journeyings about California was responsible for its origin.

In considering the road development in Los Angeles County it is only fair to say that the Automobile Club of Southern California has taken an outstanding part and in 1909, seizing upon the opportunity afforded by the adoption of a county charter, designated a committee to get the best road-building engineer who could be procured. This individual proved to be F. H. Joyner, at that time peaceably

Boulevard lighting system in Los Angeles County on the Coast route of the State Highway.

Mint Canyon road paved by Los Angeles County and given to the State.

building roads in Massachusetts; and for ten years Mr. Joyner served faithfully and well, retiring to private life in the early summer of 1919, leaving behind him a host of friends and many creditable accomplishments.

Succeeding Mr. Joyner his principal assistant, George W. Jones, was named by the Board of Supervisors as County Road Commissioner, and this thoroughly competent road builder is now engaged in that further road development which is planned by the Board of Supervisors. This body, made up in 1919 of Jonathan S. Dodge, chairman; P. F. Cogswell, formerly State Senator; Jack Bean; F. E. Woodley; and R. F. McClellan, not only has taken part in past accomplishment but also is actively engaging itself for the future; and the activity of these men is largely responsible for the fact that under the 1919 State Highway bond issue the Lancaster-to-Bailey's road was taken over by the state, as well as the Oxnard-to-San Juan Capistrano road, the San Gabriel Canyon road and the Arroyo Seco road back of Mount Wilson—the taking over of these roads by the state alleviating the white man's burdens resting upon Los Angeles County in so far as roads are concerned to no inconsiderable extent.

In furtherance of its road-building undertakings Los Angeles County, maintaining a county forester, has advanced far in highway tree planting and beautification, while from a bridge standpoint it has developed some splendid structures, the Colorado Street bridge over the Arroyo Seco in Pasadena being easily first in magnitude, while over the same arroyo some distance below is the California Street bridge, a splendid span of reinforced concrete arches. In the same general location is the concrete-arch bridge over a tributary of the Arroyo Seco at Devil's Gate, a single span of sixty-four feet over a deep and rocky gorge, while over the San Gabriel River east of El Monte is a long plate-girder bridge with reinforced concrete floor, the general bridge scheme of the county matching well up with what in all probability is California's most highly developed county system of roads.

CHAPTER XXVI

MARIN COUNTY

MARIN COUNTY, situated so close to San Francisco as to be practically a suburb, spreads over the entire area of a peninsula which might aptly be designated as the north buttress of the Golden Gate.

In topography it is mostly rugged with no coastal plain, the mountains dropping steeply down to the ocean on the west, San Francisco Bay on the east, while on the south, above the narrow channel through which the waters of the Pacific flow into and ebb from one of the world's great land-locked harbors a bluff promontory, housing Government fortifications, rises like some Gibraltar of the Pacific.

In climate and scenic attraction Marin County is alluring and many San Franciscans have made their homes there, the population of the County being of a residential character rather than commercial or agricultural, if such a term can be properly applied.

In so far as its road problems are concerned Marin County has been struggling along like many other California counties, earnestly endeavoring to provide for automobile traffic under ox-cart laws, the various boards of supervisors doing the best they could to still the wails of their fellow citizens who seemed to forget that highway construction demands money as the first requirement.

Finally turning to the United States Bureau of Public Roads, as so many other California counties have done with satisfactory and tangible results, the Marin County Board of Supervisors, made up of Casper J. Gardner, Mill Valley, chairman; M. Burke, San Rafael; William Barr, San Rafael; David Steele, Marshall; and F. W. Sweetser, Novato,

Highway across Alpine Dam. The old road is under 70 feet of water.

North of San Rafael on State Highway.

called for an engineer to advise them and in July, 1919, Senior Highway Engineer D. E. Henry made an investigation and report.

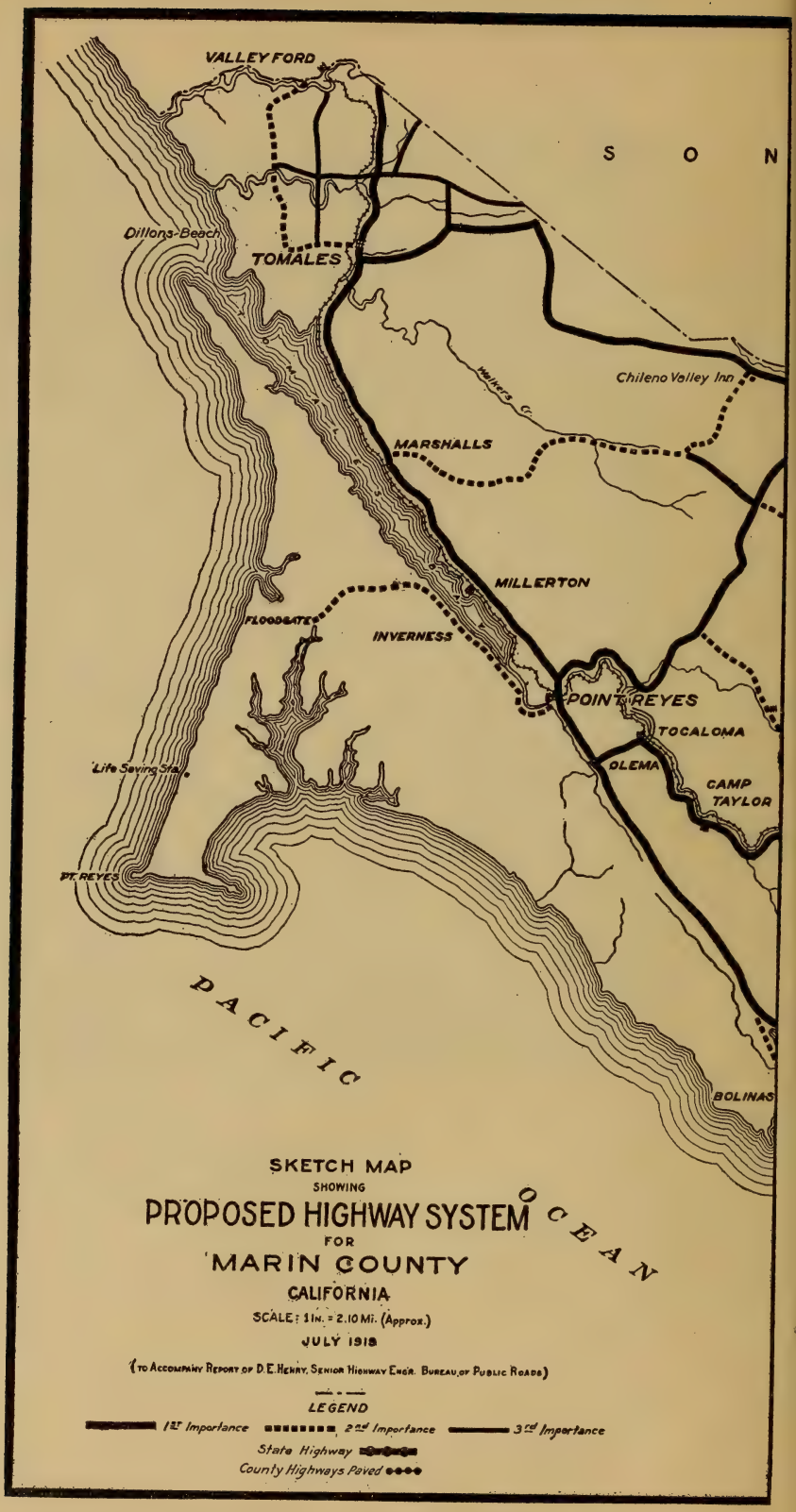
In this report Engineer Henry says: "The county road system was gone over with each supervisor in his respective district and the following features were taken into consideration: topography, soil, alignment, grades, drainage and maintenance. Considerable attention was given to the economic development, present and future, the adequacy of the present road system and future demands."

With this preliminary statement he then goes on to say: "In planning a system of road improvement for Marin County there are several features which should be considered fully. The close proximity to San Francisco, together with the many desirable residence sections throughout the county, make it attractive to suburban residents. Mount Tamalpais and Muir Woods are vast play grounds and are visited by practically every tourist coming to California; all of which contributes to the wealth of the county which is further supplemented by vast dairying interests."

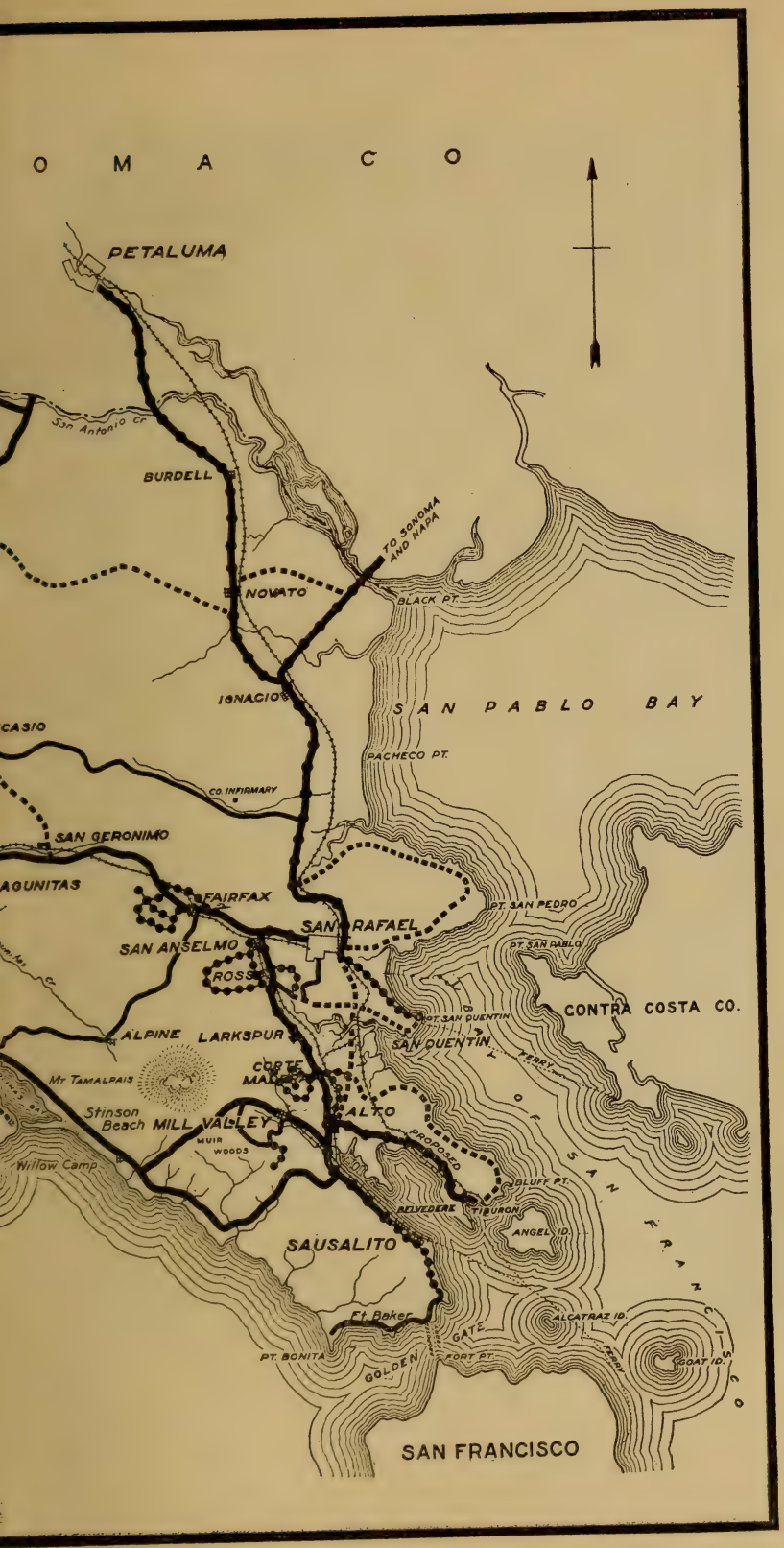
As the result of his investigation Mr. Henry filed with the Bureau of Public Roads his report recommending for the main trunk lines of travel where traffic converges from roads of "second and third importance" what he designates as "Class A" construction, a concrete surface five inches in thickness and sixteen feet in width, supplementing this recommendation by suggesting oil macadam and gravel surfacing for those traffic arteries which carry a burden so light as to render the more expensive concrete pavement inadvisable.

"The present layout of the County roads," he declares, "appears to cover the county very thoroughly. However, one feature is noticeable in that for the northwestern section of the county no connecting road has been provided, leading directly to the eastern part of the county and the county seat, the only egress being via Petaluma, in Sonoma County, a condition which should be remedied.

Upon reference to the accompanying map, which is that



Marin County, in the early part of 1920, plans a County-wide bond issue on the plan mapped out.



Building by direct tax or one or the other of the various district plans Marin County has already made a creditable start in highway building.

supplied by Mr. Henry with his report, it will be seen that this condition has been corrected by a proposed new county highway link from Chileno Valley Inn to Union School which will permit traffic originating in the section of the county named to reach San Rafael, the county seat, without unnecessary delay—not to mention passing through an adjoining county by a long and round-about trip.

In so far as road development already achieved in Marin County is concerned it may be said that under one or the other of the various road district or boulevard plans 54 miles of paved highways have been built tributary to the various towns, Ross leading in highway development with 20 miles of pavement. In the vicinity of Mill Valley 7 miles have been paved while around Corte Madera 6 miles of highways have been built. San Rafael has paved 5 miles, Sausalito 5 miles, Manor and Belvedere 4 miles, with Larkspur contributing 3 miles as its share. Other plans involving about 30 miles of pavement are under way, while a bond issue for a county-wide system following upon the lines laid out in the Henry report is planned for early in 1920.

So much for the actual road building situation in Marin County; and dismissing this from consideration it is pleasant to turn for consideration to the reasons why Marin County is now planning to engage in highway construction upon a more elaborate scale.

As Engineer Henry says, it is a highly desirable residential location; and for proof of his statement it is only necessary to look at the slopes of Tamalpais and the foothills which drop down therefrom. On every side are homes, tiny bungalows dwelt in by writers or artists or nature lovers, or the pretentious mansions and well kept grounds of the wealthy, the comparative freedom from fog, the number of days of warm sun and the matchless view afforded by this or that perch upon hill or mountain side serving to attract many all-year residents.

Other folks also have built homes upon the hillside, living in the country in the summer, and going back to the busy hive across the Golden Gate in winter when the rains are on,

On the slopes of Mount Tamalpais. Highway in middle distance; fire trails shown on hills.

Drive along shore of Bolinas Bay built by board of supervisors

A birdseye view of Bolinas Bay and shore line drive.

living in hotels or apartments until such time as they can go back to the country life. The fact that ferry service, in so far as automobile transportation is concerned, has been utterly inadequate has kept many people who would like to live in Marin County away, this condition now being in process of correction with at least two new automobile ferries under plan, not to mention a vast dream which plans for a far-flung bridge.

In so far as present conditions are concerned the Marin County Board of Supervisors is doing the best it can eternally patching up the different roads, putting in permanent bridges and culverts as a start toward better things, building the grade for a new road now and planning for what eventually is to become one of California's most famous touring roads. This plan involves the construction of a touring road along the saddle of Mount Tamalpais to the highest peak, connecting with the Fairfax-Bolinas Bay road at the top of the grade to the west of Alpine. In parts already existent as a woods road, over-grown with underbrush perhaps, the proposed touring drive will thread along the very backbone of the ridge with a view that covers all the four points of the compass—bay on one side, with the Berkeley Hills beyond and to the east, the Golden Gate and San Francisco to the south, the Pacific to the west with the pin point Farallones in the distance, and to the north the bluff and foam washed shore, along which a highway is planned that will some day, connecting with the coast roads of Sonoma and Mendocino County, form part of a shore line highway from San Francisco to Oregon.

CHAPTER XXVII

MERCED COUNTY

MERCED COUNTY has the honor of being the only California county to pass a good roads bond issue during the participation of the United States in the war, voting $1,250,000 for a concrete county highway system on November 5, 1918, after a campaign unique in California road-building history, owing to its attendant difficulties, local ordinances requiring the wearing of influenza masks during the entire period of the campaign, which may aptly be designated as the only road campaign in history conducted by an aggregation of boosters so muzzled as to be almost unable to talk.

Public meetings, because of the existence of the influenza epidemic, were impossible, only one being attempted, this one being to all intents and purposes a failure though taking place in the open air, extensively advertised, and supplying the first moving picture show offered to the people of the county in more than two weeks. This meeting was centralized around Charlie Chaplin, whose filmed antics for once failed to draw, the speaker of the evening being Charles F. Stern, at the time a member of the State Highway Commission, and one of the most eloquent advocates of highway improvement in the state.

Not disheartened in the least, the Merced County Good Roads Association, under the active direction of John R. Graham of Merced, its organizer and president, installed a battery of telephones in its headquarters, called up every home in the telephone directory, wrote letters to every voter, commandeered every newspaper in the county, the Merced *Evening Sun*, the only daily paper, getting out a

State Highway bridge leading into Merced County from the north. Built by Merced County.

The only campaign for good roads, so far as is known, conducted with everybody muzzled was that held in Merced County in the fall of 1918 during the influenza epidemic. Chairman John R. Graham and his force of pretty girls.

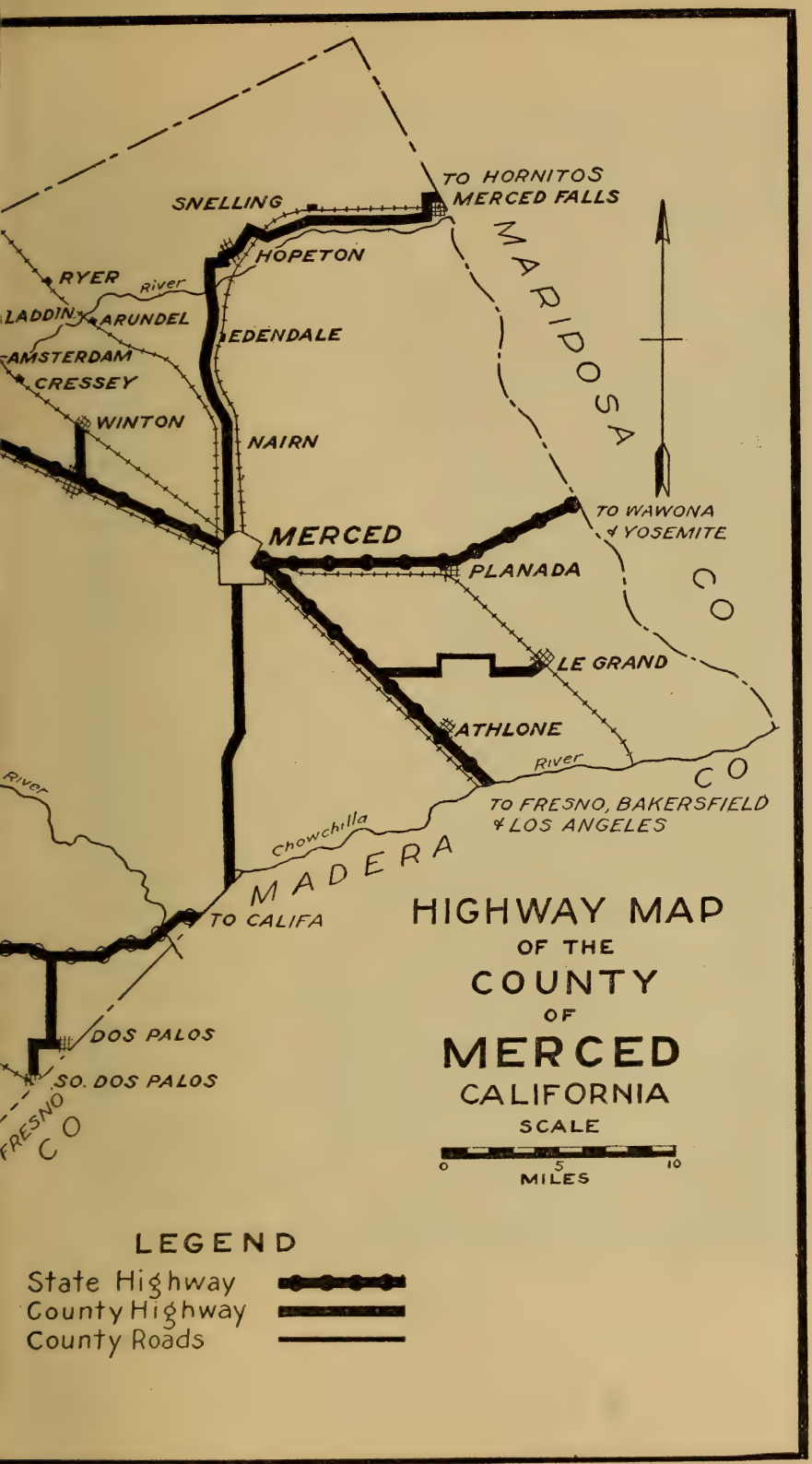
special good roads edition on Saturday, November 2d, every display advertisement in it, donated to the cause of good roads as the result of untiring work done by Mr. Frank R. Barcroft, one of Mr. Graham's helpers and a prominent Merced business man, having this laconic statement, "We Want Good Roads," with the name of the owner of the space beneath, and when the ballots were counted one hundred fifty-eight votes more than the required two-thirds majority gave Merced County good roads.

The system planned involved 125.7 miles, of which 107.5 was part of the county road system proper, the remainder, 18.2 miles, being provided as part of the Pacheco Pass State Highway lateral under the 1919 State Highway bond issue, being taken over entirely by the State but originally planned as a co-operative undertaking by county and state, and connecting the San Joaquin Valley State Highway with the Coast Highway, also supplying a link in a road plan advocated for years as "The Yosemite-to-the-Sea" highway.

The type of road provided for under the bond issue is concrete, not less than sixteen feet wide and five inches thick, and the system, in process of construction in 1919, is being built by the Merced County Board of Supervisors, made up of T. H. Scandrett, Merced, chairman; D. K. Thornton, Le Grand; Frank Pebley, Atwater; G. H. Whitworth, Newman; and C. S. Cothran, Los Banos; the engineer in charge being Arthur E. Cowell, County Surveyor, under whose advice and with whose co-operation the road system was laid out; an advisory board appointed by the supervisors and made up of five men, one from each supervisorial district, participating also. This advisory body is as follows: John R. Graham, Merced, chairman; W. E. Bunker, Gustine; Bert Hoyle, Dos Palos; E. L. Morley, Le Grand; W. T. White, Livingston.

Paralleling the State Highway main line in part on the west side of the county one of the highways provided reaches from South Dos Palos on the Fresno County line to the Stanislaus County line within a mile of Newman, connecting with a Stanislaus County highway, which, with

From Dos Palos to the Stanislaus County line north of Gustine the highway under construction in 1920 forms part of the West Side Highway from Fresno to San Francisco.



The State Highway from Califa to the west is the Pacheco Pass Lateral. The State Highway from Merced to the eastward is the main entrance into the Yosemite and carries touring travel from all over the world.

the exception of a few miles, is paved to the San Joaquin County line, where a paved highway supplies a direct route to Tracy and thence to San Francisco bay points, or by way of Stockton into the Sacramento valley and on to Oregon.

South from South Dos Palos, a Fresno County road, planned for permanent concrete construction, supplies a direct line to Fresno, where it connects with the State Highway, the various links supplied by the county highway systems forming a long-dreamed-of short cut, popularly designated as the "West Side Highway," so called from the fact that both in Stanislaus and Merced Counties the districts traversed are known as "The West Side," each being for years a sort of a good roads' Cinderella, neglected and almost forgotten, each helping to pay the county's cost of the State Highway, which, separated by adobe roads from the west side, in rainy weather might just as well have been laid out on the moon.

The Pacheco Pass road of the State Highway connects with this road at Los Banos and forms, as has been set forth above, a link in the Yosemite-to-the-Sea Highway, supplying tourists with an alternative route into Santa Clara County points, the beach resorts of Santa Cruz, Monterey, and San Mateo Counties, connecting coast and valley lines of the State Highway, and originally planned to be paid for on a co-operative basis, but now, under the 1919 additional State Highway bond issue, entirely to be constructed by the state.

That part of the road system, reaching from Livingston to Gustine and forming a cross-county tie-up near to the northern boundary line, traverses one of the richest sections of the county where seven hundred sacks of beans produced in 1916 pioneered the way for a bean production in 1917 of 70,000 sacks, the costs incident to hauling this tonnage over roads almost hub deep, the soil being a sandy loam in character, being so heavy as to cut the producers' profit materially.

From Irwin north it will be seen that a road is planned, ending at the Stanislaus County line, where it connects with

Cox Ferry Bridge built by Merced County Board of Supervisors. This structure is on the highway system voted under a bond issue.

a concrete highway, part of the Stanislaus County system leading to Turlock. This paved road, supplying a way out which involved a minimum bad roads' haul for the residents of Merced County in the vicinity of Irwin and Hilmar, attracted much business originating there to Turlock, and the striking example of a paved concrete road cut abruptly off and abutting against a sad mess of chucks and ruts and bottomless sand, supplied a campaign picture which did its work in getting good roads for Merced County.

The road planned north from Merced through Amsterdam to Snelling and thence east to Merced Falls passes through the oldest section of the county in point of settlement, Snelling being the first county seat, and some of the old buildings still standing evidence the days of '49 when "Fort Snelling" was an entryway into the land where Argonauts from all parts of the world flocked in search of gold.

At Merced Falls, situated on the Merced River, which flowing down from the Yosemite is used in lumbering, is a huge mill where millions of feet of lumber are sawed each year, hundreds of men being employed, and the establishment of a road to this point opened up to the merchants of Merced a new volume of business, which before, on account of difficulty of access, amounted to very little, while to the residents of Merced Falls easy access was provided to the diversions of modern life, the distance being practically nothing in this day of the automobile when supplemented by the modern type of paved highway.

Each year, into Merced County, a tremendous volume of tourist travel comes, bound for Yosemite Valley points, while to supplement this road traffic a huge road tonnage of soil products, constantly increasing as the land and water are brought together, supplies that commercial need which alone is justification for the building of paved roads, and, with the present system provided for, the Board of Supervisors and other progressive citizens are planning yearly extensions, a few miles at a time, until in the end the ranchers of all districts will have economical roads to haul over and be freed from heavy hauling costs.

CHAPTER XXVIII

MONTEREY COUNTY

This county, situated about one hundred miles south of San Francisco Bay and something like three hundred miles north from Los Angeles, comprehends road problems of no ordinary degree from the fact that it is situated on the coast and is largely mountainous in character with abrupt bluffs along the ocean shore which rise hundreds of feet above the surf.

One hundred and twenty-four miles long from north to south and forty-four miles wide, it is divided into three sections which may be described as mountains and hills on the east, mountains and hills on the west and between these ranges the Salinas valley, approximately one hundred miles long with an average width of ten miles. Through the Salinas Valley flows the Salinas River with bottom lands of rich alluvial soil on either bank and through the valley the coast line State Highway supplies a main trunk line which bears the principal road tonnage of the county, agricultural touring traffic combining to make up an ever-increasing road burden.

To supplement the main trunk line of the State Highway with a county road system as well as to provide funds for necessary bridge construction, the people of Monterey County in 1915 issued $570,000 in bonds, $370,000 of this amount being set aside as the county's share of the cost of bridges along the State Highway, the raising of a sum of such magnitude to help the California Highway Commission in its tremendous work of building a state system of roads being fairly indicative of the spirit of the people of Monterey County who applied the remaining $200,000 to starting a

One of Monterey County's famous drives, near Carmel.

Once each year stage coaches and Cowboys travel the roads of Monterey.

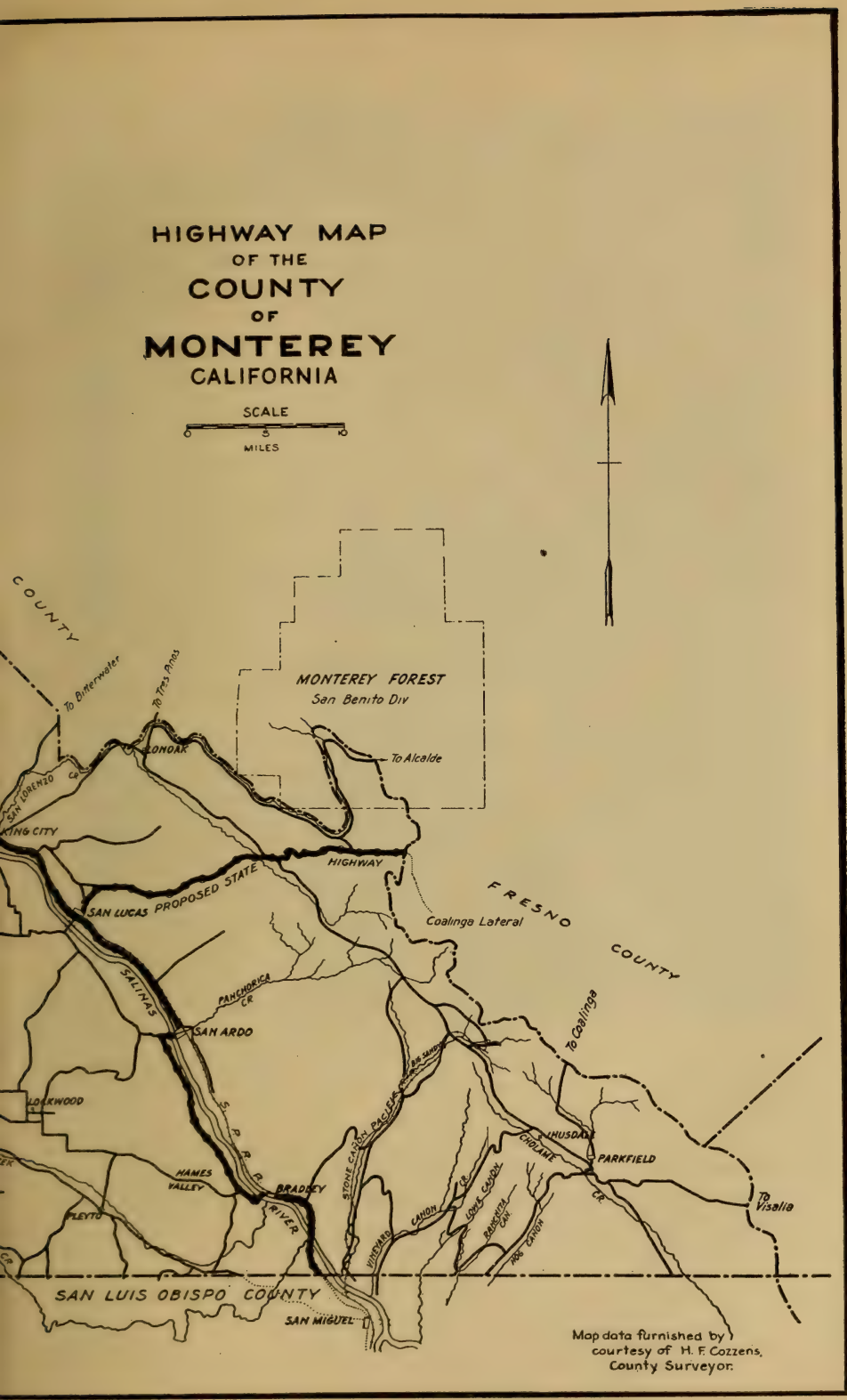
Looking south on the Carmel-San Simeon route of the State Highway.

road system of their own to which they have added each year an appreciable mileage until, in 1919, eighty-one miles of paved highway already laid down marks the contribution of this county to the good-roads mileage of the state.

The men responsible for the bond issue above mentioned were the members of the 1915 Board of Supervisors, Messrs. J. L. D. Roberts, Monterey; Harvey Abbott, Salinas; Wm. Casey, San Lucas; Jefferson Mann, Watsonville; and Paul Talbot, King City, who added to the duties imposed upon them by law, the additional burden of campaigning for good roads, which was considerably more of a job in 1914 and 1915 than at the present time and in the accustomed manner of the good roads booster they stumped the county back and forth, finally securing the approval of the voters of the county for their plan. With comparatively little money at their disposal (the greater part of the money raised under the bond issue being provided to help the state) inexpensive roads were necessary and to meet this need the Board of Supervisors adopted an oil macadam pavement 5 to 6 inches in thickness, varying in width from 12 to 15 feet, road thickness and width being governed by the road traffic existent in the particular locality, construction costs figuring under pre-war prices about $5000 per mile, the total length of the highways laid down by the bond issue being forty miles, the additional forty-one miles of road since built being provided for out of the yearly taxes, emphasizing the fact that the 1919 Monterey County Board of Supervisors, made up of Frank P. McFadden, Blanes; George Dudley, San Ardo; Robert Sterling, Salinas; Dr. J. L. D. Roberts of Monterey; and Paul Talbot of King City, is a unit in believing that it is sound policy to build a few miles of the best type of road possible each year.

The individual charged with the actual details of construction work in the starting of Monterey County on good roads, was Mr. H. F. Cozzens, the county surveyor who used the limited funds at his disposal to the best effect, not contending for one moment that the type of road supplied equaled in quality or permanence the concrete roads put in by other

The Coast Highway shown is one of the routes provided for in the 1919 State Highway bond issue and in conjunction with the roads of Santa Cruz and San Mateo Counties, the State Highway already built and that planned for construction from Oxnard to San Juan Capistrano will supply an all-coast road, San Francisco to San Diego.



With the exception of highway along coast and that reaching inland from San Lucas, both forming part of the State Highway Commission's plans, all highways shown on this map of Monterey County are paved.

and wealthier counties, but endeavoring only to lay down the best roads possible with the money at hand and it may be said in all fairness that the roads put down have stood the test, bearing in some places a volume of traffic for which they were never intended and standing up under this traffic remarkably well.

In so far as the road needs of Monterey County are concerned they are twofold in character, a mass of heavy hauling centralizing at Salinas, where one of the largest beet sugar factories in the state is located, the total being about 300,000 tons a year, while tributary to Watsonville, in Santa Cruz County on the Monterey County line, another heavy volume of traffic exists, made up of apples hauled to the various drying and packing houses. In addition to the tonnage above mentioned, five thousand acres in the Salinas Valley devoted to potato raising contributes each year approximately twenty-five thousand tons of road traffic in addition to which dairying, berry growing, bean, wheat and barley production supply more heavy traffic for the county highways.

As may be seen from the accompanying map the road system laid down ties all of the different towns of the county together and connects each one of them with the State Highway which serves the communities in the southern part of the Salinas Valley so satisfactorily that the road needs of this section exist in only small degree, owing to the fact that the valley toward the San Luis Obispo county line is so narrow as to need practically only one road. From south to north the State Highway practically divides the county in its northern stretch, from Salinas to the San Benito county line climbing over the San Juan grade, which it may be said in passing, is a totally new road, the old San Juan grade, now abandoned to coyotes and jack rabbits, being formerly a terror of steep pitches and grades.

The most important stretches of county road so far laid down are those extending from Salinas to Monterey, a distance of twenty miles and that from Salinas to Watsonville, sixteen miles in length, the sixteen mile stretch of road from

Between Salinas and Monterey.

The Monterey Coast south of Carmel showing present road.

United States wagon train on the old San Juan grade. The State Highway route over San Juan grade has supplanted this famous old road.

Castroville to Monterey being of only slightly less importance. Another road that under the 1919 State Highway bond issue assumes importance of no mean degree, is that running south from Monterey to Carmel, six miles long, which will form a part of the proposed Carmel-San Simeon State Highway.

The Monterey-Carmel road already is a famous bit of highway, climbing up from Monterey on an ascending grade which unfolds as it rises a view of wonderful panoramic beauty. To the northward is the sweep of Monterey Bay with the white surf line on the shore, while beyond lift the Santa Cruz mountains in the distance. In the foreground is quaint Monterey suggesting, with its age old adobes, the Monterey where California history, it might almost be said, was born, for here in 1602 came Viscaino who named Monterey Bay in honor of Gaspar de Zuniga, Count of Monterey and Viceroy of Mexico. Here also Junipero Serra landed, his memory being emblazoned on a monument erected by Mrs. Jane L. Stanford in the Presidio of Monterey which was a Spanish garrison before Mexico took over the territory and government and which, since the Spanish-American war, has housed varying contingents of American soldiers intended for duty in the Philippines or returning therefrom.

In view of the fact that Monterey County has numbered itself among the good roads counties of California, it is interesting to know that it is also regarded as one of the most famous cattle ranging areas of the state where the old time care-free cowboy life of the West exists. Evidencing this a Rodeo is held each year at Salinas, where thousands of automobiles carry tens of thousands of visitors to listen to the cowboys' shrill "yip-ee," "Ride 'im, cowboy, ride 'im," or "Let 'er buck," and at this time the old West and the new West meet upon common ground, for out of the past onto smooth paved roads the old-time stage coach with its half-broken horses and its whooping cowboys in chaps comes galloping; calling back, for a brief season of make-believe in the California Rodeo, the old-time frontier when any road at all was good enough.

CHAPTER XXIX

NAPA COUNTY

For many years Napa County enjoyed the reputation of being one of California's most progressive counties in relation to road development, and was provided with wide and smooth, well-graveled or macadamized highways, which were well drained, thoroughly sprinkled, and kept in first-class shape throughout.

In arriving at this condition this county achieved the distinction of being one of the first of California's counties to take advantage of that law which provided for the formation of road districts and bonding thereof for better highways, the road so improved leading from the city of Napa into Brown's Valley, a district highly productive and extraordinarily attractive from a residential standpoint.

The man responsible for this improvement was Jasper Partrick, now dead, supervisor of the district, who had the backing of the people of Brown's Valley, and alongside the road that was built by these good-roads enthusiasts of more than a decade ago there stands a tablet to testify that Napa County then as now believed firmly in good roads.

With the advent of the motor vehicle, however, road conditions in Napa County, as in other parts of California, changed, and the highways which had stood up well and given good service under deliberate horse-drawn traffic ground up and blew away under the swift movement, heavy-load, and hind-wheel thrust of motor truck or automobile.

The burden imposed upon the roads of Napa County, it may be said, is of twofold character, this region being one of the most popular sections of California from a touring standpoint as well as highly productive agriculturally, prunes of

The Monticello Bridge over Putah Creek in the Berryessa Valley. A beautiful three-span stone structure.

Above Calistoga under the shadow of Mount St. Helena. A typical Napa County stone bridge in foreground.

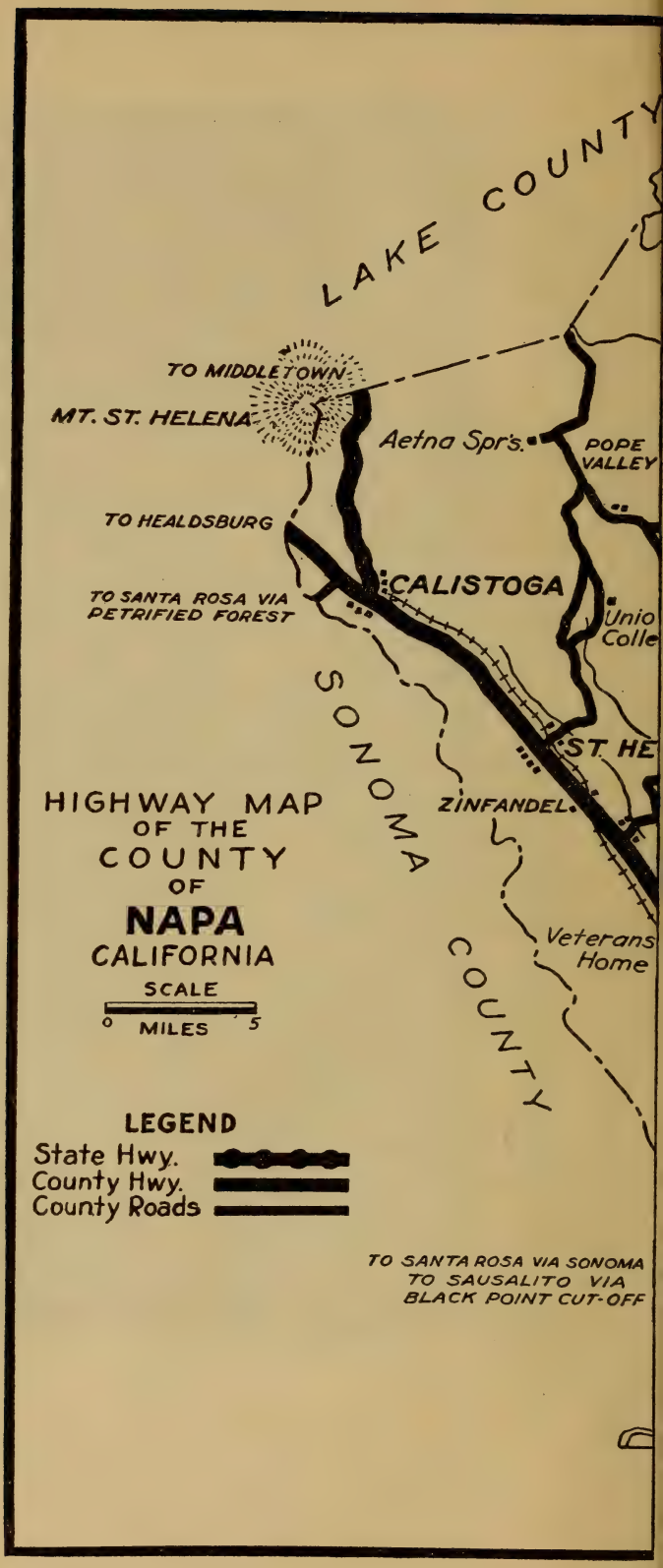
superior quality, cherries, pears, apples, and other deciduous fruits supplying a heavy road tonnage, while grains of various kinds produced in quantity serve to add thereto.

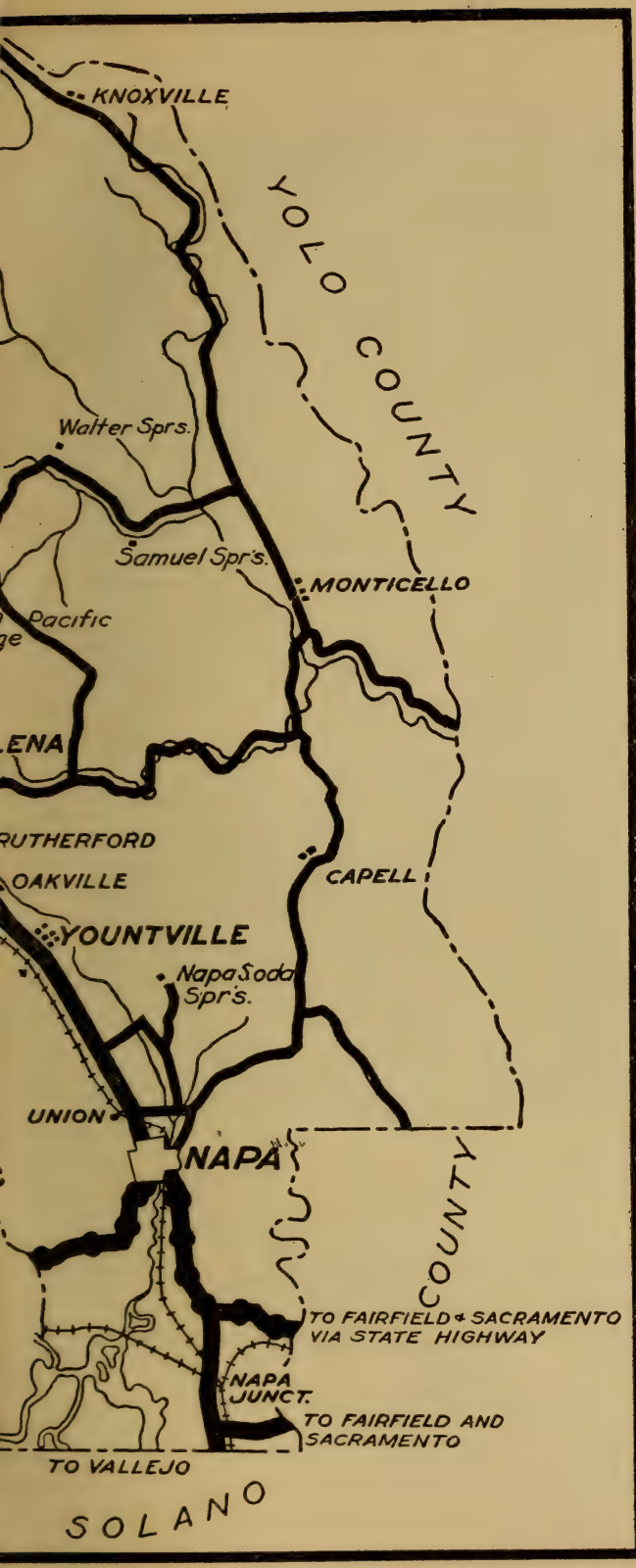
In addition to the products named, for many years the wine-grape production of the Napa Valley also supplied an extraordinarily heavy road load, hundreds of thousands of tons of grapes being hauled to the various wineries where they were crushed, this district being one of the most famous in the state of California for both the quality and quantity of dry wines produced.

With road burdens such as described, the matter of road maintenance became at length a problem, and in 1917 Napa County began building concrete roads, the first stretch put down being in the lower part of the county on the main highway between Napa and the Solano County line, the man responsible for this improvement being Thomas Maxwell, supervisor of the district, who raised the necessary funds by direct tax, the man in charge of work being County Engineer E. P. Ball, the highway built being four miles in length.

Following the building of this stretch of road a movement for the building of a concrete highway throughout the entire length of the Napa Valley was initiated, in which the other members of the Board of Supervisors—Messrs. S. J. Webber, chairman; Yountville; John McCormick, St. Helena; C. H. Wassum, Monticello; and Mark Hein, Napa—joined with Mr. Maxwell. This movement, it may be said, was at once approved by the Napa County Farm Bureau, with Henry Wheatley, president, the following being directors: W. E. Cole, Ed Somers, Anita Lubben, D. A. Dunlap, H. C. Melone, A. W. Bill, Charles Sunkler, Jules Volper, H. J. Clement, John Redfield, James Pieratt, T. G. Gardner, Walter Schaefer, Mrs. L. B. Miller, Franklin Moyer, Dale Blockman, George Martin, E. A. Gilson, S. Kelly, Ed Young, D. O. Taplin, W. W. Gamble, Thomas Maxwell, Frank Gordon, Charles Cantoni, and W. L. Mitchell; while Farm Adviser H. J. Baade, Jr., dropped all other work to talk good roads. In addition to the farm bureau the Napa County Chamber of Commerce, with E. J. Drussel, mayor of the

The road problems of Napa County are comparatively simple, the building of an eighteen-foot wide concrete road up through the center of the Napa Valley from Napa to Calistoga being taken care of under a bond issue, the extension shown from Calistoga to the Sonoma County line to be built out of current funds or money raised by direct tax. A paved road provided for by the Sonoma County bond issue will supply an all-paved connection between Calistoga and Healdsburg.





In so far as the State Highway is concerned Napa County, while having little mileage, is fortunate in being connected with both Coast and Valley trunk lines.

The highway reaching from Calistoga to Mount St. Helena is the present toll road. Under the 1919 State Highway bond issue a road is to be built "connecting the roads of Napa and Lake Counties," but in the latter part of 1919 no route had been adopted. Plans for highway betterment between Napa, Capell Valley and Monticello form part of the 1920 road building program of the Napa County Supervisors.

city of Napa, as president, F. S. Cairns of St. Helena as vice-president, and C. F. Wyer as secretary, also took part, all of the directors actively participating.

The plan finally arrived at involved the raising of $500,000, and on May 28, 1919, this sum was voted by the people of Napa County by a majority of something like seven to one, Dr. Arthur Chisholm of Napa being the man who led throughout the campaign. The Calistoga Chamber of Commerce, with T. M. McGrail, president, C. A. Carrol, A. D. Rodgers and Mrs. Ruth Fuller Field, its secretary, assumed charge of the campaign in the Calistoga district, with E. L. Armstrong, Charles Armstrong, Owen Kenny, C. E. Carroll and others participating, while in St. Helena the active man in charge was H. J. Chinn who was assisted by W. F. Bornhorst and F. W. Mieling, president, and secretary of the Chamber of Commerce, and Messrs. Ed Bellarie, F. S. Cairns, L. F. McDonald, F. L. Alexander, and F. B. Mackinder.

From the accompanying map it will be seen that the highway provided serves only a limited section of the county and is but twenty-seven miles in length, this stretch, however, carrying a major part of the county road traffic and requiring, under the old plan, by far the greater proportion of the county's annual road fund in patchwork and repairs. With this fund released the plan adopted and made possible by the bond issue provides for a general road improvement throughout the county; a better highway over the Berryessa grade into the valley of that name, which is in the eastern part of the county, being one of the first roads planned.

In relation to bridges, Napa County stands unique among the counties of California, having adhered practically without exception to the construction of stone bridges rather than concrete. More bridges of this type exist in this county than in all the other counties of California combined, principal among these being the huge three-span structure near the town of Monticello which spans Putah Creek, an ever-living stream in the Berryessa Valley which flows into the Sacramento River. Another is the Big Trancas bridge across the

Between St. Helena and Calistoga. To be paved with concrete in 1920.

Between Napa and Rutherford. To be paved with concrete in 1920.

Napa River a few miles above the city of Napa, the total number of stone bridges and culverts in the county being more than four hundred. In the construction of these bridges much attention has been devoted to artistic development and, as a whole, they supply an added attraction to the scenic beauty of this little California county which, situated so close to San Francisco as to be practically a suburb, nestles among hills that suggests some tiny bit of mountain fairyland. Throughout the county many highly mineralized springs exist of proven curative value, the waters of one particular spring being nationally advertised and shipped all over the United States, supplying much road traffic from spring to railhead. In the upper part of the Napa Valley, at the little mountain town of Calistoga, in the old days was one of California's most famous resorts, and here, in the shadow of Mount St. Helena, where Robert Louis Stevenson wrote "The Silverado Squatters," is the gateway into Lake County, where thousands of people flock each year. At Calistoga half a dozen geysers tell of subterranean fires, while a few miles distant the vast trees of a petrified forest lie strewn about.

In the center of the valley the town of St. Helena is the focus of a rich area in which is situated one of the most famous of California's sanitariums, maintained by Seventh-Day Adventists, while at Napa, where tidewater navigation is had upon the Napa River, a volume of manufacturing has arisen that contributes to the county's wealth.

The standard established by Napa County is creditable indeed, the concrete roads built and under plan being eighteen feet wide and at least five inches thick; the future program being to connect the Napa County road system with the Sonoma County system north of Calistoga, the connection with Lake County being provided for by the State Highway and involving the taking over of or supplying of an alternative route to a toll road, that relic of mediaeval times, which climbs over the massive shoulder of Mount St. Helena toward Lake County and is blocked by a gate where traffic for many years has paused to pay.

CHAPTER XXX

ORANGE COUNTY

In 1913 this county passed a bond issue of $1,270,000 for a permanent highway system, building with the money thus supplied 118.2 miles of concrete road 4 inches in thickness, 32.8 miles being of a width of 16 feet; 70.8 miles of a width of 18 feet and 14.6 miles of a width of 20 feet, the system generally being regarded throughout California as one of the best in the entire state. In advancing the bond issue under which these roads were provided, a County Highway Commission was appointed by the Board of Supervisors, the original commission being made up of M. M. Crookshank, chairman, of Santa Ana; Richard Egan, of San Juan Capistrano; and D. C. Pixley of Orange, with Daniel S. Halladay as Chief Engineer. During active construction work the following commissioners were in charge for the greater portion of the time, D. C. Pixley of Orange; R. J. McFadden, Anaheim; W. T. Newland, Huntington Beach, and N. T. Edwards, Orange, their chief engineer being S. H. Finley of Santa Ana.

Not content with the very satisfactory mileage built under the bond issue the Board of Supervisors of Orange County have added quite an extensive mileage of permanent highways built out of their annual road building funds 40.8 miles of the roads so built being of concrete, 4 inches in thickness from 16 to 22 feet wide, while 4.9 miles is of asphaltic concrete 5 inches thick and 22 feet in width, the man in charge of this work being County Surveyor J. L. McBride, the total road mileage of the county in the summer of 1919, so far as permanent county pavements are concerned, being 163.9 miles. It may be said the Board of Supervisors made up of

Orange County not only has a big mileage of paved highways but also builds wide roads where traffic justifies.

The Oxnard-San Juan Capistrano State Highway follows this rugged coast line through Orange County.

An Artist Colony on the Coast of Orange County on the line of the Oxnard-San Juan Capistrano Highway.

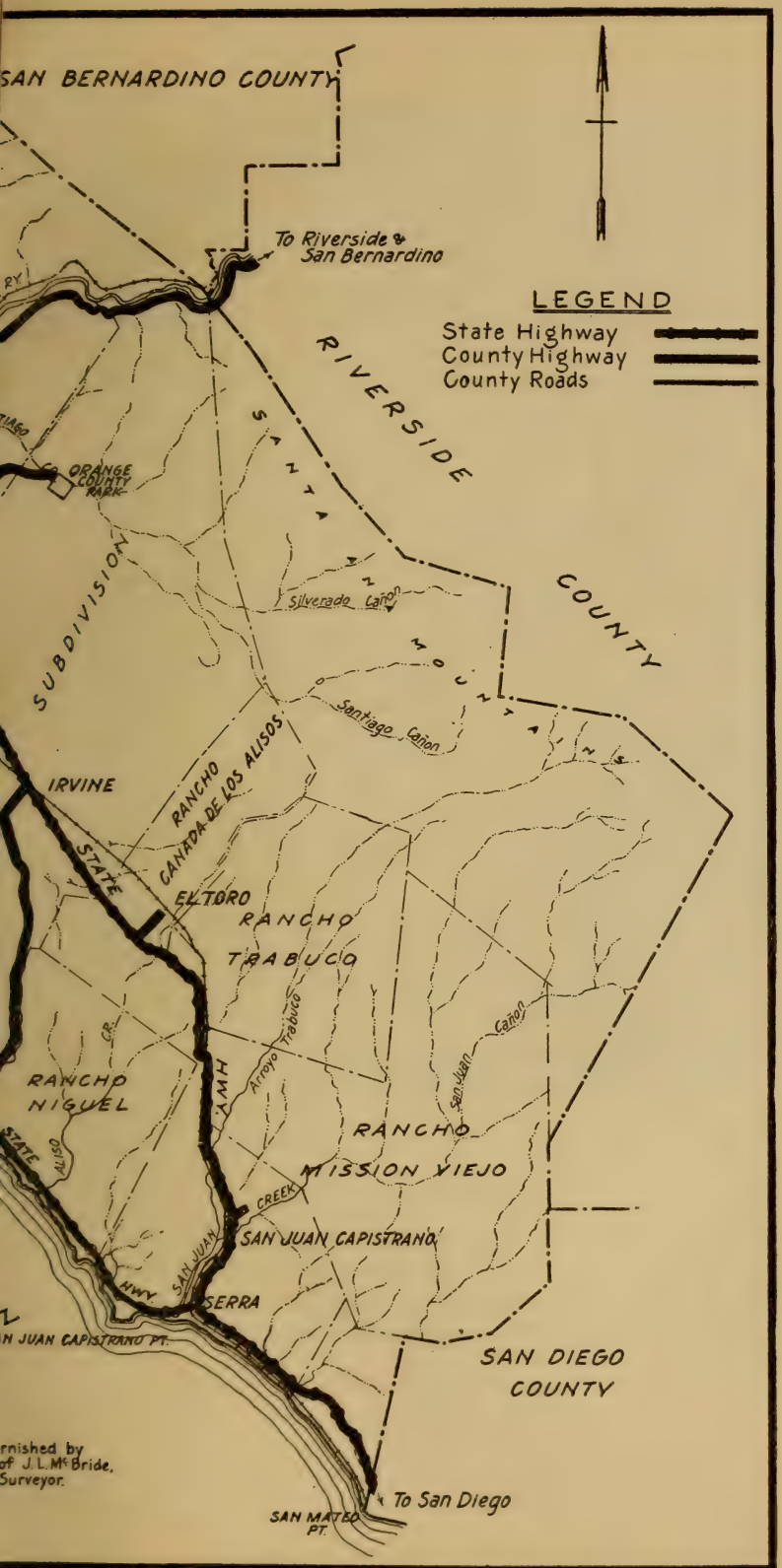
T. B. Talbert, chairman, of Huntington Beach; Wm. Schumacher, Buena Park; Fred W. Struck, Orange; Jasper Leck, Tustin; and H. E. Smith of Santa Ana, which was in charge during most of the work laid the foundation for the present splendid system.

Most good roads enthusiasts have dreamed, perhaps, of that happy condition which approximates the impossible and comprehends unlimited road building funds. Few of them, however, have ever hoped to live to see such a condition, yet this very condition exists in Orange County for so valuable are the developed acreages there, so much wealth is pumped out in the recently developed oil fields and so great is the bean and sugar beet production that the Board of Supervisors has practically all the money it needs for road development of the most impressive kind.

In the road distribution of the county it may be said that the State Highway system which trends through the county in a general northwestwardly and southeastwardly direction forms the main trunk line to which the county system is tributary and over this main line an enormous flood of travel pours, the development of interurban automobile stage and truck traffic having followed promptly on the development of the road system and reached a tremendous volume. Supplementing the State Highway the county system links every town in the county with every other town, in addition to providing roads in every section where production is sufficient to warrant the building of paved highways.

One of the road developments of Orange County which is creditable is that which connects with the good roads systems of Riverside and San Bernardino Counties and supplies an almost direct line from the mountains of the interior to the ocean. This road, winding its way high up on the hillsides through Santa Ana Canyon, is an attractive tourist boulevard giving a twofold view of mountains on one side with valley and ocean on the other, and is of the type of construction employed in the general county plan. In extension of this road the concrete highway known as the Laguna Canyon road is worthy of mention, leaving the

The State Highway Route along the coast is part of the Oxnard-San Juan Capistrano ocean shore highway provided for by the 1919 State Highway bond issue and forms a link in a proposed coast road from Mexico to Oregon.



Orange County, in the latter part of 1919 has 146.60 miles of paved highways.

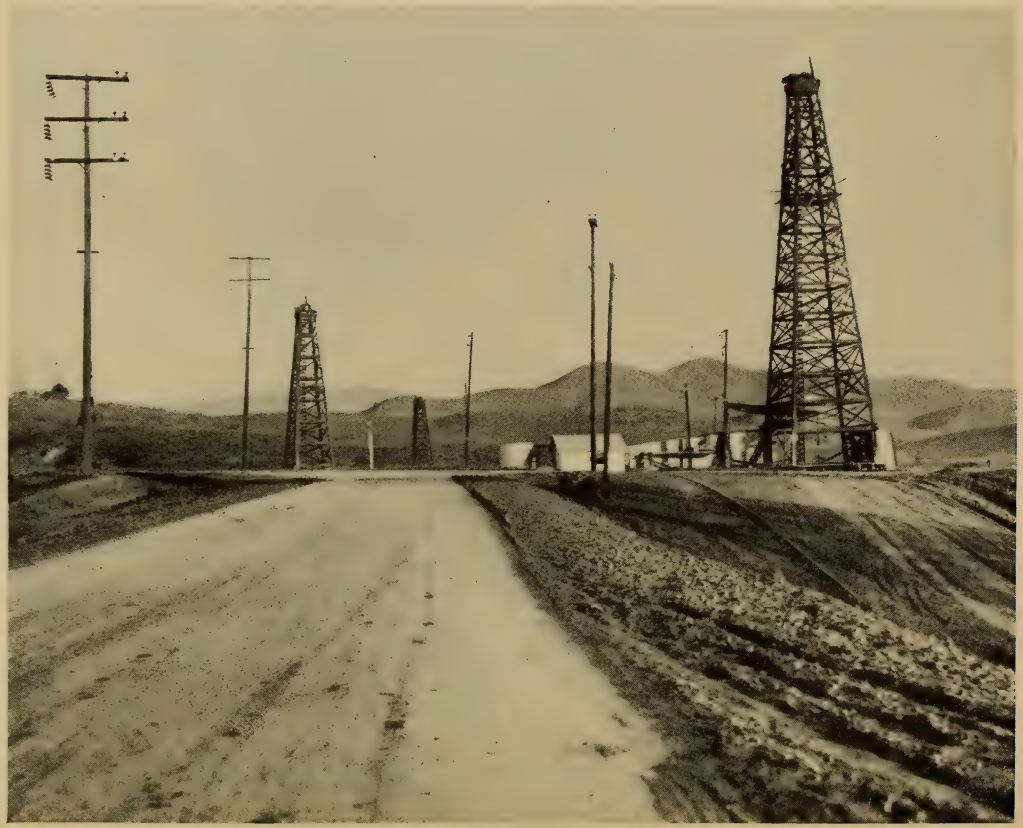
Owing to its small size and high assessed value it has been able to develop one of the most comprehensive county highway systems in California.

State Highway at Irvine, a short distance southeast of Santa Ana, and reaching the ocean shore at Laguna where an attractive beach is to be found.

In the northern part of the county where the well developed oil fields are producing much wealth each year, the road system has been extended to serve all the commercial needs which exist and tributary to this area is a road already under development reaching through Brea Canyon and connecting with the already established Los Angeles County system, supplying a short cut from Pomona and adjacent points to the ocean shore and connecting with the Los Angeles-Riverside State Highway. Just how comprehensive the road system of Orange County is may be seen by reference to the accompanying map and while the roads there charted have been built with reference to supplying the citizens of the county with commercially needed highways, county road development from a strictly touring standpoint has long been contemplated involving the construction of an ocean shore road from the Los Angeles County line near Seal Beach to Serra, just below San Juan Capistrano Point, where the State Highway emerges from the interior and skirts the ocean shore under towering palisades, so close to the waves, sometimes, that the salt spray from the breakers drifts across the right of way.

In planning this road a connection between the various beach resorts of Orange County was, perhaps, the governing factor and with its construction Seal Beach, Sunset Beach, Huntington Beach, Newport Beach, Balboa, Laguna, and Arch Beach will be made easily accessible by a splendidly picturesque drive. This road, originally conceived in the minds of Orange County's Board of Supervisors, has been comprehended in the plans of the State Highway under the 1919 bond issue and two surveys, one made by the county, the other by the State, have been made. Of these surveys it may be said without injustice to the State Highway officials, the county survey, made by County Surveyor McBride, to the lay mind, is the best in that it is laid out along purely scenic lines following the curve of the coast and

Paved highway; cement-lined irrigation ditch and orange grove in background.



Orange County has supplied paved roads in the prolific oil producing section of the County.

disclosing one continuous panorama of splendid views that shift and change with almost kaleidoscopic endlessness, while the State Highway line, laid out with the idea that a straight line is the shortest distance between two given points, leaves the coast occasionally just far enough to spoil the view.

The right of way for this road lies mostly within the property holdings of one individual, Mr. James Irvine of San Francisco and Santa Ana, whose title traces back to a Spanish grant for 108,000 acres, comparatively little of which has been sold, and when approached by the officials of Orange County and told of their plans, Mr. Irvine at once announced that he would deed the right of way to the county without cost, this public-spirited act following the donation of a public playground known as Orange County Park, by Mr. Irvine, to which a concrete highway tracing up through Santiago Canyon is now being built.

From a scenic standpoint the road above described is one of the most important tourist road developments now under plan in the entire state and forms the southernmost link in that proposed ocean shore boulevard planned under the new State Highway bond issue which reaches from Oxnard in Ventura County to a connection with the State Highway below San Juan Capistrano Point. As evidence that the people of the county appreciated the efforts of those who participated actively in the good-roads movement it might be stated that Mr. S. H. Finley, who served as chief engineer, Mr. N. T. Edwards, one of the commissioners, and Mr. H. A. Wassum, who was an enthusiastic supporter of the work, have all been elected and are now serving upon the Board of Supervisors. Supplementing the efforts of the board and working with them in full harmony to secure the utmost county road development is Mr. J. L. McBride, the county surveyor, and these men, backed by a well-defined public sentiment which is based on a first-hand knowledge of what good roads are, have but one object in mind, to make of Orange County the banner good roads county of California. and are contemplating another bond issue.

CHAPTER XXXI

RIVERSIDE COUNTY

THIS county, in 1915, bonded for $1,125,000, and since that time has built 105.39 miles of sixteen-foot-wide, four-inch-thick, concrete pavement and 35.17 miles of oil macadam of the same width, the thickness of the oil macadam roads being five inches and their location being in those sections where travel, at the time they were planned at least, was comparatively light. Though easy enough in the telling, Riverside County did not achieve good roads without a hard fight, for in 1915 that tremendous good roads sentiment which in 1919 has reached into every part of the United States was in the very earliest stage of its development and the "Show me, I'm a Missourian" with his "Good roads are all right, but—" was more actively present everywhere than, thanks be, he is in 1919. None the less Riverside County got a good roads bond issue safely across, a County Highway Commission being appointed by the Board of Supervisors to lay out a road plan, to suggest a method of financing and, generally, to take charge. This commission was made up of W. B. Clancy, president of the Citizens National Bank, chairman; A. P. Campbell, secretary; and S. C. Evans, all of these men being residents of Riverside; Mr. Campbell being formerly city engineer of that place; Mr. Evans now being senator from Riverside County and the man who got the rights of way practically all without cost.

With these men the then Board of Supervisors, made up of T. F. Flaherty, Riverside, chairman; J. T. Hamner, Corona; J. A. Packard, Riverside; C. D. Hamilton, Banning; John Shaver, San Jacinto, joined actively in putting the

Magnolia Avenue—one of Southern California's famous highways.

The road up Mount Roubidoux affords a wonderful panoramic view.

bond issue across and history says that they had quite a festive time, finally carrying the issue by about five to one, the engineer appointed to take charge of construction work being Mr. George M. Pearson, formerly county surveyor of Riverside County.

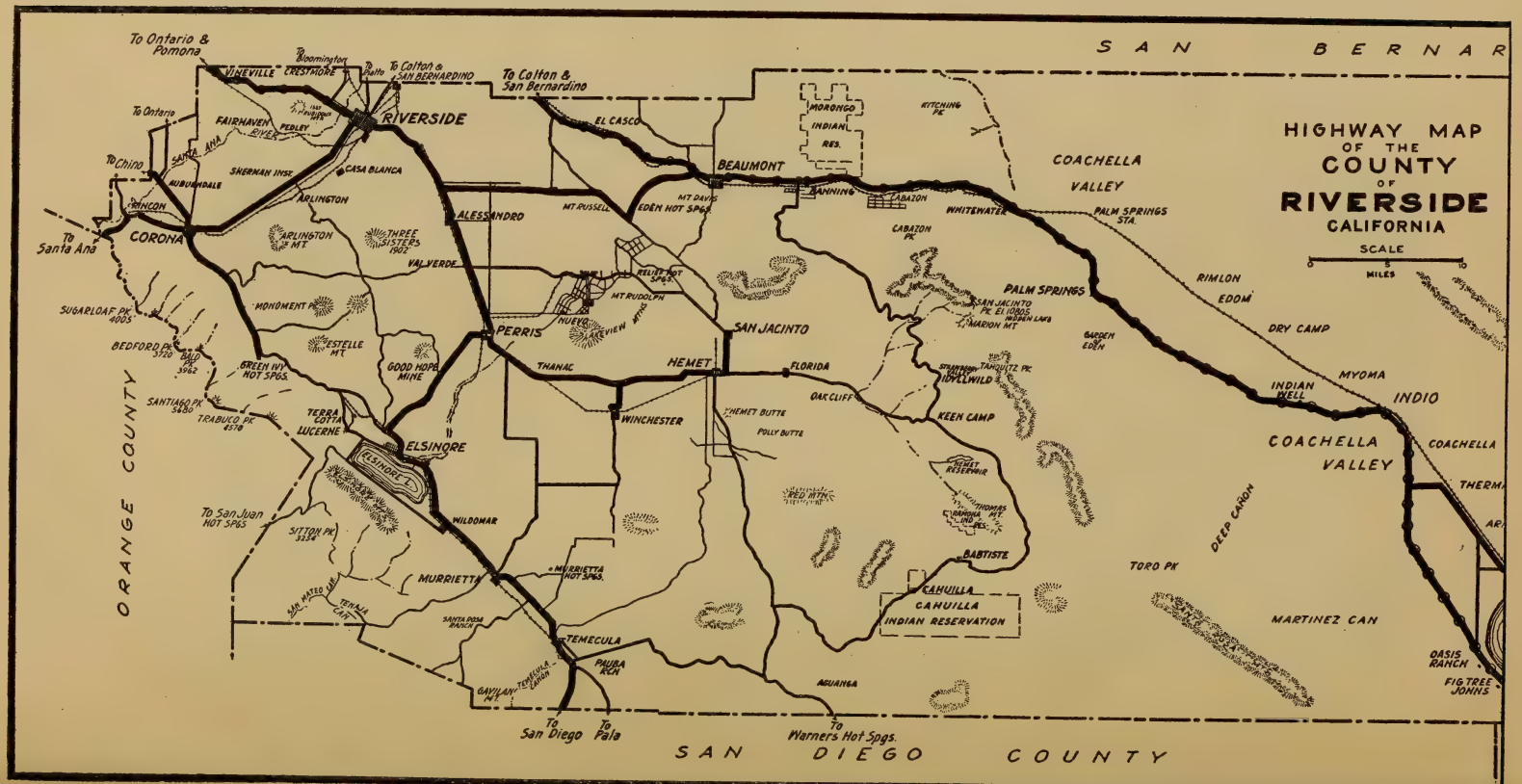
With a county about similar in area to one of the smaller eastern states it is quite apparent that the Highway Commission and its engineer had a big job on hand; the road distribution, as will be seen from the accompanying map, tying up the different towns of the county around which the main traffic problems centered.

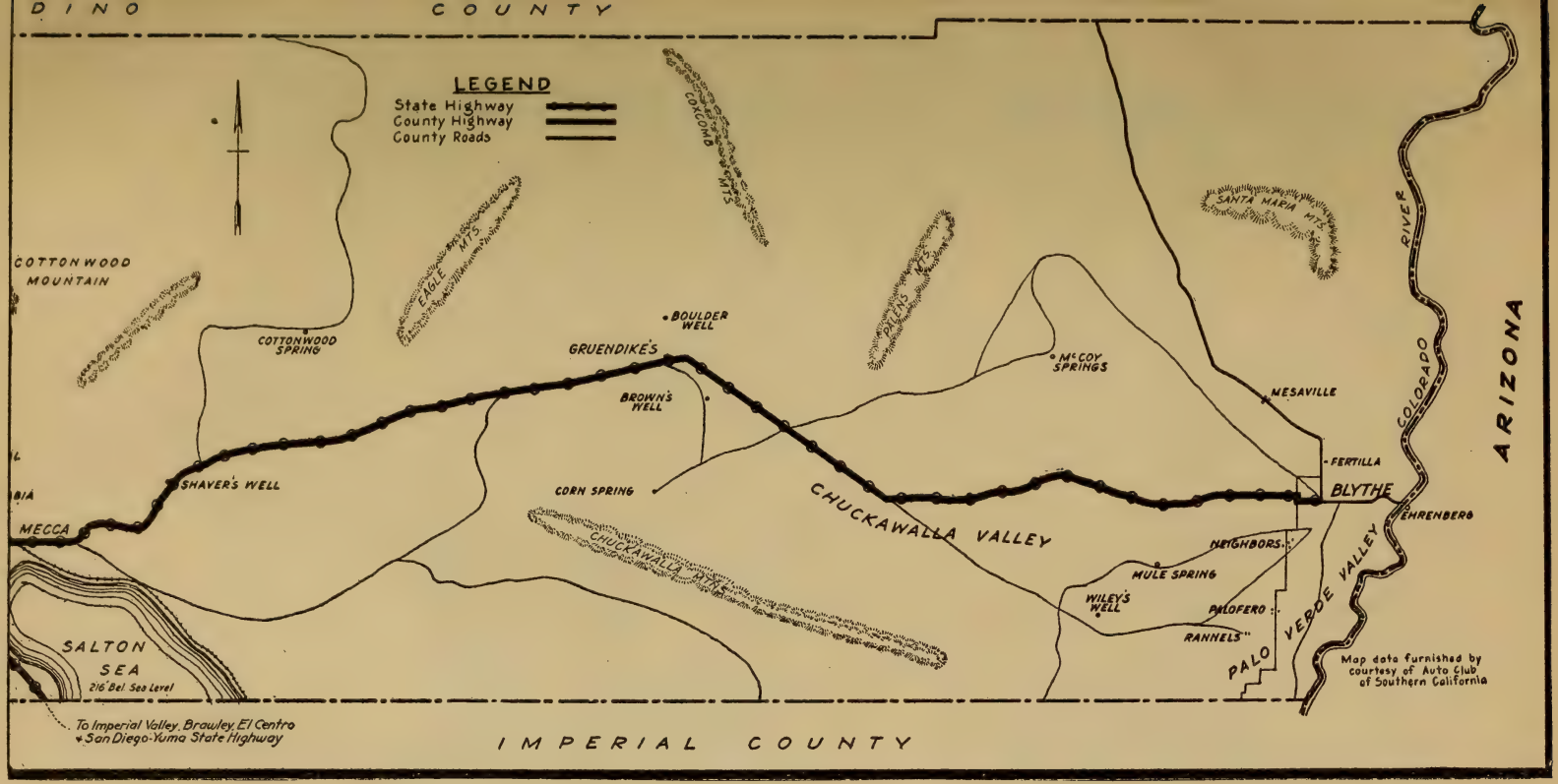
This traffic was large and varied, a recent survey of products grown in Riverside County recording that of citrus fruit alone, 331 carloads of lemons and 1374 cars of oranges were hauled in 1918 from point of origin to railroad. In addition to this road load, 486 tons of almonds, 1045 tons of apples, 10,176 tons of apricots, 634 tons of olives, 5692 tons of peaches, 184 tons of walnuts, 6250 tons of grapes, 130,000 tons of alfalfa, 13,120 bales of cotton, 600,000 sacks of grain, 31,000 tons of hay, 55,000 sacks of potatoes, including sweets, 40,000 bushels of corn, 7300 tons of tomatoes, and 70,000 sacks of beans served to supply that commercial need which, in the main, is the prime justification for expensive paved roads.

In so far as the State Highway system is concerned Riverside County, prior to 1916, had only a few miles, which reached into Riverside, a distance of about twelve miles, this stretch being the county seat lateral. In 1916, however, the Coachella Valley branch of the State Highway into Imperial County, on the western side of Salton Sea and connecting at El Centro with the San Diego-Yuma road, was provided for and now forms a main trunk line through the eastern part of the county to which, under the 1919 bond issue, another State Highway route has been tied reaching from Mecca, north of the Salton Sea, to Blythe at the Arizona line.

The history of this road is interesting and its presence in the 1919 bond issue is due mainly to the efforts of Chairman

The western part of Riverside County, shown on this page comprises practically all the paved highways of the county. Much of the State Highway route shown has been paved by the county.





The State Highway route shown on this map of the eastern part of Riverside County is proposed. It reaches from Mecca to Blythe only, being connected with the State Highway route near Thermal by a county highway. The State Highway route west of the Salton Sea reaches into the Imperial Valley and connects with the San Diego-Yuma route.

Flaherty of the Riverside County Board of Supervisors, who made a host of friends by the fight he put up to include this road in the bonding plan and won out by sheer persistency from a start that seemed to afford him not a chance.

As will be seen by reference to the accompanying map, the road system developed under the bond issue ties up Riverside, the county seat, with every town in the county and also connects with the road systems of Orange and San Diego Counties, the road bearing the major burden of travel being that, perhaps, which trends to the southwest from Riverside through Corona to the Orange County line.

Next to this road is that which, under the plan being advanced in San Diego County in 1919, will form part of what is popularly known as the Inland Highway. This highway trends generally to the south, reaches Perris, Elsinore, and on toward Temecula in Riverside County, skirting the shores of Elsinore Lake and supplying a touring trip that is full of scenic interest as well as giving the residents of San Bernardino and Riverside Counties direct access to San Diego by way of Escondido.

From this road at Perris a branch of the highway trends to the eastward reaching Hemet and San Jacinto in the central western portion of the county.

In the eastern part of the county the road needs are cared for by the San Bernardino-El Centro-Yuma branch of the State Highway which passes Beaumont, Banning, Indio, Coachella, Thermal, and Mecca, by way of San Gorgonio Pass; traverses the Coachella Valley with its unique date ranches, where government experiment stations are engaged in fostering the development of this new California crop.

From Mecca to the Palo Verde Valley, where cotton is raised in wonderful excellence and quantity, the new Mecca-Blythe State Highway line above referred to serves all needs, traversing the center of Chuckawalla Valley, Eagle Mountains, Coxcomb Mountains, Palens Mountains, and Santa Maria Mountains to the north, while to the south the sawtooth ridges of the Chuckawallas lift up in grotesque array.

In discussing this stretch of state road it is only fair to say

Highway in Coachella Valley, showing date ranch.

Riverside County has built paved roads in the desert and given them to the State Highway.

The State Highway through Banning.

that Riverside County has put in eleven miles of rock road in the desert near Indio, in addition to which twenty-two miles have been graded and oiled, the expenditure involved approximating $70,000 contributed directly to the State Highway.

In great portion mountainous and comprehending widespread stretches of desert where water has not, as yet, been brought to the naturally fertile soil, Riverside County is interesting from a touring standpoint and one road, developed purely from this viewpoint, is entitled to mention.

This road, affectionately dubbed Jack Rabbit Trail by the people of Riverside, is formally known as San Gorgonio Drive, a wonderfully scenic way down from the plateau to the west of Banning, which discloses the sweep of the mountains to the north and west and looks out over a valley dotted with orange groves in the distance, upthrust pointed hills in the foreground and the dim of the bluffs that flank the ocean far behind.

To end this brief discussion of the Riverside County road system without touching upon the road up Mount Roubidoux would not be fair, even though this road lies wholly within the city limits of Riverside. Uphill it winds, looping this way and that, one way up and the other way down, to the very peak of the hill and from this point the view is wonderful. One looks down upon the tops of Riverside's many handsome homes, and over a long perspective view of the State Highway, while in the background to the west and north and east a piled-up wall of mountains lifts back of a green-patched valley where oranges and lemons grow.

As for the future, while no definite plan has yet been put in force, each year a bit of good road is put in here and there by County Surveyor A. C. Fulmor and in the end this county, even as big as it is, with its deserts and its mountains, will have no cause to feel ashamed of its road development, the present Board of Supervisors, which is the same as the one which put the bond issue across save for Mr. Shaver, who has been succeeded by Mr. R. S. Smith, being firmly united in its road-development plans.

CHAPTER XXXII

SACRAMENTO COUNTY

To Sacramento County belongs the honor of being the first California county to pass a bond issue for good roads, the sum provided being $600,000, with an additional $225,000 for bridges, the year of the issuance of the bonds being 1908, the roads built being of oil macadam, and David Ahern, H. K. Johnson, and C. W. McKillip of Sacramento, J. H. Donnelly of Folsom, and L. C. Thisby of Walnut Grove, who made up the Sacramento County Board of Supervisors, being the men who built them, under direction of C. M. Phinney, the County Surveyor. A Highway Commission was appointed to share in the work, this Commission being in part made up of W. E. Gerber, Archibald Yell, Philip Johnson, Philip Kohn, John Donahue and Philip Reese.

Scarcely had these roads been finished before it became a foregone conclusion that further development must take place, and in 1914 another bond issue was essayed, which failed to carry. No whit abashed and eternally optimistic, as all dyed-in-the-wool good roads enthusiasts are, the men who had taken part in this unsuccessful attempt arose the morning after, girded their loins, and proceeded to lay the foundation for another campaign. In extension of this purpose petitions were put in circulation for the appointment of a County Highway Commission, and within a short time, the necessary signatures being obtained, the Sacramento County Board of Supervisors appointed F. B. McKevitt, W. S. Caruthers, and G. N. Randle to lay out a county highway system. R. C. Irvine is now serving in place of Mr. Randle, who found that it was impossible to

Bridge across American River at Folsom. Built by direct tax. Old bridge in background is to be torn down.

Highway along Sacramento levee north of Sacramento, built by Natomas Company of California. Length 13 miles.

continue and do justice to his own affairs, Mr. Irvine's appointment being by way of proof of the triumph of eternal justice, he being a member of the 1895 Bureau of Highways and as much responsible for the start of highway improvement in California as any other man.

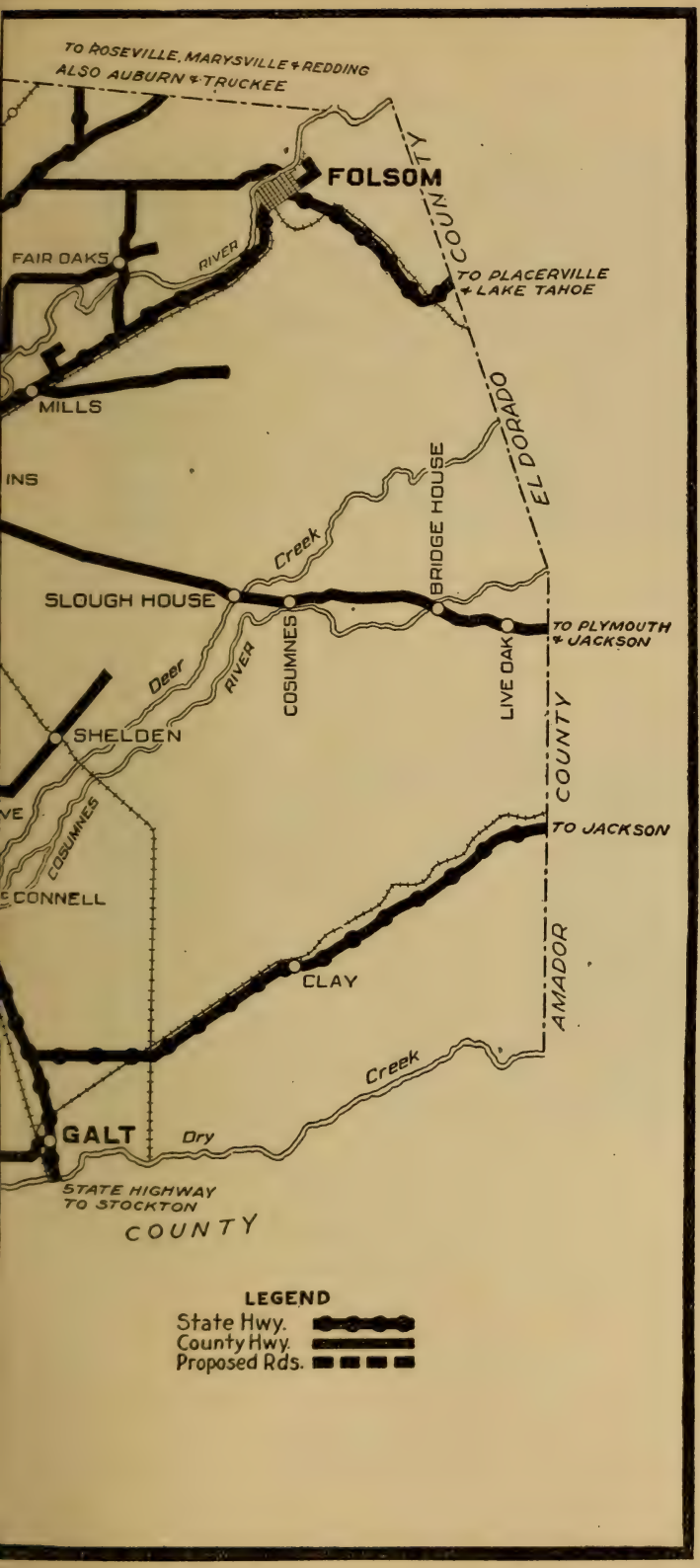
In casting about for an engineer to serve as their executive officer the Sacramento County Highway Commission settled upon R. M. Morton, who had served as engineer in the building of the San Joaquin County highways.

To help in the work of road improvement the Sacramento County Good Roads Association had been organized, with George W. Peltier as president, Charles B. Bills as vice-president, F. S. Peck as treasurer, and W. A. Meyer as secretary, among other members of the board of directors being Robert T. Devlin, L. S. Upson, J. C. Havely, Herman Davis, John T. Skelton, president of the Sacramento Chamber of Commerce; Mrs. C. K. McClatchy, J. E. Langdon, managing editor of the Sacramento *Bee;* Lynn C. Simpson, editor of the Sacramento *Union*; and Craddock Meredith of the Sacramento Retail Merchants' Association. At the proper time a campaign was put on, under the leadership of Mr. Peltier, which resulted in carrying the bonds, the amount involved being $1,750,000 and the road mileage being 124.42, to which has been added other construction which makes up a total of 150 miles.

During the campaign four members of the Board of Supervisors, William J. O'Brien and C. E. Mahoney of Sacramento, John Russi of Folsom, and Perley K. Bradford of Elk Grove, got out and worked for the bonds, while Robert E. Callahan, the chairman, an individual of definite opinions and accustomed to stick by them, was opposed, believing and getting an irritating number of others to believe that the direct tax method was superior to bonds, backing up his statements by pointing to over a million dollars' worth of county improvements, made up of bridges, roads and public buildings, which had been paid for as built by direct tax at a low tax rate.

In the ensuing battle, however, right prevailed, as right

An extension of the highway built by the Natomas Company is planned to connect with a proposed Sutter County highway. An extension of the Sacramento-Del Paso-Elverta highway will also connect with a Sutter County highway and supply a short cut to Marysville, Yuba City, Chico and upper valley points. The county highway reaching down the Sacramento River to Rio Vista connects with a highway proposed under the 1919 State bond issue which will connect Rio Vista with Fairfield and Suisun and will supply an alternative and very attractive route to San Francisco when completed. It is built on top of the high river levee and carries a heavy volume of tonnage supplied by the prolific orchards of the river bottom section.



With one of the best systems of County highways in the State, Sacramento County is each year adding a few miles of paved roads built by the Board of Supervisors out of current funds. The State Highway route shown from Folsom toward Placerville is probably the most popular route to Lake Tahoe and forms an alternative route to that lake by way of Auburn and Truckee. An extension of the road from Sheldon to Slough House is part of the county's road plan. The State Highway route to Clay from the main line above Galt was paved by the County and given to the State.

usually does prevail, at least in the copy books which Mr. Spencer used to publish years ago, and all concerned promptly forgot their differences and proceeded gladly to build roads, the principal highway provided in the system adopted being that extending down the Sacramento River thirty-four miles to a point opposite Rio Vista in Solano County, passing through what is termed in "boost" literature "The Netherlands of America," where tens of thousands of acres of rich alluvial soil, protected from overflow by levees, supplied with ample water and warmed by almost continuous sunshine, produces enormous crops.

From a scenic standpoint also this road is thoroughly worth while, spread on the top of the high levee and following the meanderings of the Sacramento River, which, rating fourth among the navigable rivers of the United States in point of tonnage, stands easily first in variety of water craft. Connecting with a proposed State Highway road at Rio Vista in Solano County by means of a tremendous bascule bridge, costing $250,000, a joint county enterprise, this road forms an alternative route into San Francisco, connecting with the State Highway at Fairfield, the county seat of Solano County.

Next in importance to the river boulevard is the Slough House Road, which, in the old days, lived up to its name by turning into a quagmire in the rainy season through which it was sometimes impossible to drag even an empty wagon. Two road connections from Sacramento to the Fair Oaks-Folsom foothills district were also supplied under the bond issue, the section reached being devoted largely to orange and olive production and also esteemed one of the most attractive suburban home sections in the county. One of these roads leaves Sacramento by way of the H Street bridge, the other over the Auburn State Highway connecting with Greenback Lane, both forming links in a short and attractive tour reaching Folsom over a concrete bridge built with funds provided by direct tax on plans drawn by County Surveyor Drury Butler's office.

Between Hood and Franklin. This picture was used during bond campaign.

This picture, taken in same location shows effect of bond campaign.

On the river levee below Sacramento. Hauling from the orchards was practically impossible over this road. Picture made in 1916.

The new highway. Picture made in 1919.

Another road of much importance is that reaching Clay Station from Galt and forming part of the Amador County lateral of the State Highway, while the Sheldon Road, the Del Paso-Robla-Elverta Road, the Pocket Road, and other short stretches form a concrete county highway system which, with the roads put in by Supervisors Russi and Bradford by direct tax, supplies what in 1919 is the second largest concrete county highway mileage in the state. Worthy of mention in concluding the discussion of the Sacramento County highway system is a thirteen-mile stretch of concrete road built upon the Sacramento River levee by the Natomas Company of California, a corporation engaged in reclaiming vast areas of rich bottom land. This highway, put in to serve the road needs of the district, is attractive from a scenic standpoint equally with the down-river stretch, and to make it more popular the Natomas Company has supplied numerous shaded camping and picnic places below the road along the Sacramento River bank.

Notable bridge structures in addition to those provided under the first bond issue have been built by the Board of Supervisors under direct tax, the I Street and M Street bridges serving the public, the Southern Pacific Railway and the Oakland, Antioch and Eastern electric railway line, respectively, Sacramento County, Yolo County, and the railway corporations sharing in the cost. The Twelfth Street bridge over the American River on the Auburn State Highway is another massive concrete structure built by the Board of Supervisors, while a huge bascule bridge at Walnut Grove supplies a link in the down-river highway, which, before completion, will have another bridge at Isleton, funds therefor being provided in the 1916 County Highway bond issue.

All in all it may be said that Sacramento County is doing creditable highway work, and the two new members of the Board of Supervisors, Messrs. Charles S. Alvord and John Scholefield, who in the fall of 1918 succeeded Messrs. O'Brien and Bradford, have already aligned themselves with the hold-over members of the board as in favor of more concrete roads.

CHAPTER XXXIII

SAN BERNARDINO COUNTY

With an area of twenty thousand one hundred fifty-seven square miles this county is the largest county in the United States, almost exactly equaling in size the combined area of Massachusetts, Connecticut, and New Jersey, and it might be said that its road problems are of equal magnitude owing to the fact that the greater part of the county's area, lying to the north and east of the Sierra Madre and San Bernardino mountains, has been known for years as "The Desert," this term being relative only, as vast acreages there need only water to bring them into productive use.

To the south and west of the mountains is the main settled portion of the county in the San Bernardino Valley, an area about equal in size to the state of Rhode Island and here, where ample water is to be had at little cost oranges, lemons and grapefruit are produced each year in tremendous quantity supplying a heavy road tonnage which is moved from place of origin to market or shipping points over a splendid concrete county highway system to provide which a bond issue of $1,750,000 was voted by the people of the county in 1915.

The road system provided under this bond issue consists of 124.24 miles of concrete highways, sixteen feet wide and four inches thick with three foot shoulders of oil bound macadam, the overall width of the highways being twenty-two feet. In addition to the concrete roads built under the bond issue, 96.14 miles of 4 inch-thick, oil bound macadam roads twenty feet wide were comprehended therein, to serve those sections of the county where the road burden was not of sufficient tonnage or volume to justify the more expensive

Looking down river at Colorado River bridge at Topoc, Arizona.

Perspective view of same bridge from the California side of Colorado River.

Putnam and Valentine, Photo.

The Hundred-and-One-Mile Drive follows the crest of the ridge for miles.

type of pavement, the total extent of paved roads provided under the bond issue being 220.38 miles which may be regarded merely as a start.

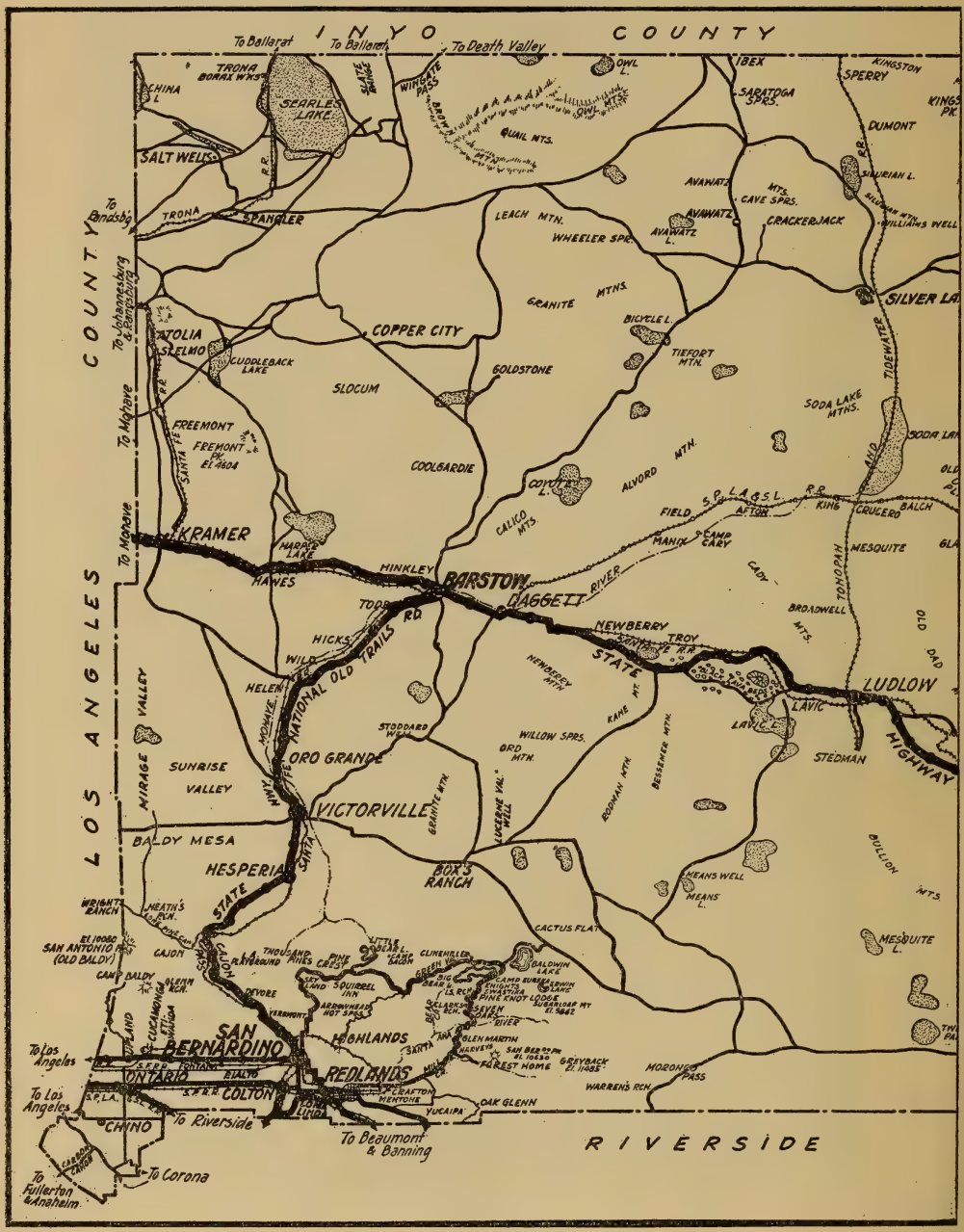
Practically all of this mileage lies within the small area south-west of the mountains, the exception being a paved road reaching northward from the city of San Bernardino, the county seat, to the summit of Cajon Pass, popularly known as the "Gateway into California," from which point an unpaved county road leads out into the mystery of the desert to Barstow where it forms a connection with the Barstow-Needles road.

To represent them in the construction of the roads provided for by the bond issue the San Bernardino County Board of Supervisors appointed a county highway commission made up of Messrs. J. B. Gill, San Bernardino; J. J. Prendergast, Redlands; and W. A. Freemire, Ontario; Mr. Prendergast serving only a short time and giving place to George S. Hinckley of Redlands.

The engineer selected to take active charge of the work was Mr. J. S. Bright, Jr., of San Bernardino and during the entire period of construction the Board of Supervisors, the Highway Commission and the engineer worked in entire harmony with only one thought in mind, to provide a sadly needed county highway system in the shortest time compatible with securing an economical job.

Perhaps the most important road both commercially and for tourists built by San Bernardino County under the bond issue is that beginning at the west county line near Ontario and running through the heart of the San Bernardino Valley to San Bernardino by way of Colton near which place it connects with the State Highway. This road, in addition to supplying a paved highway for the heavy hauling which has been developed there, furnishes one of two alternative routes parallel to the Foothill Boulevard for travel between Los Angeles and San Bernardino.

In the section of the county around Redlands also the road tonnage is heavy, more than 5000 carloads of oranges being the normal yearly shipment which naturally must be hauled

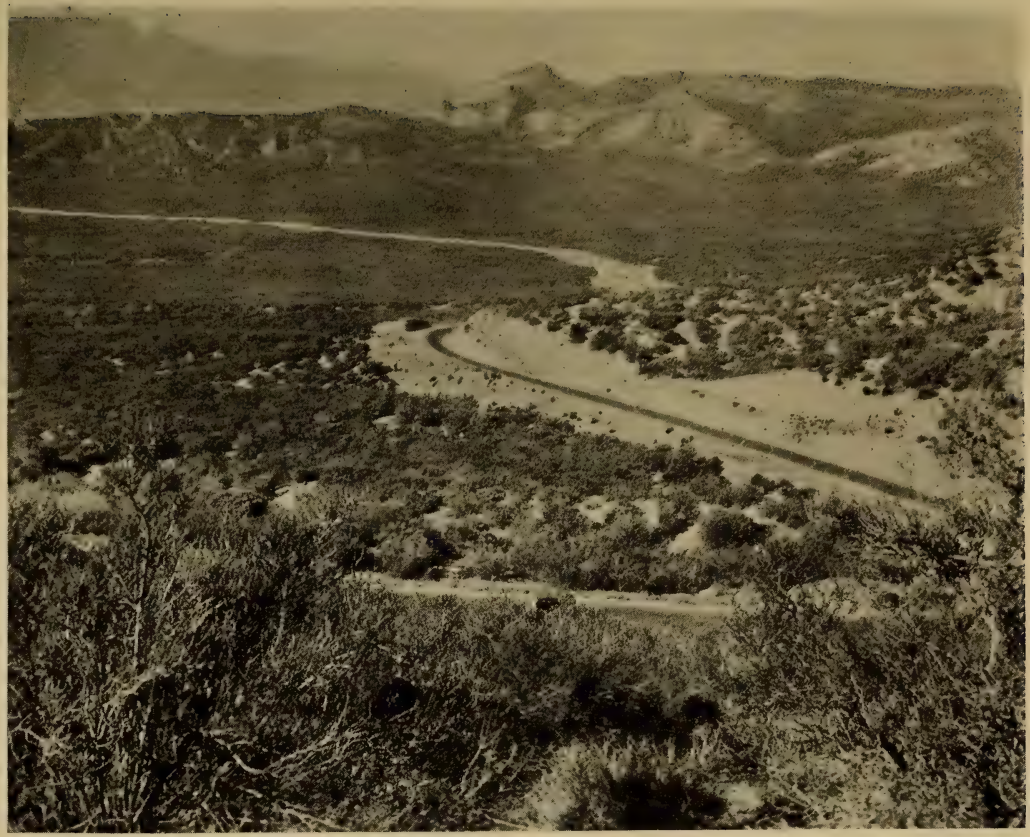


The highway development of San Bernardino County is centered around San Bernardino and Redlands, about half of the State Highway route reaching Victorville having been paved by the county and given to the state.

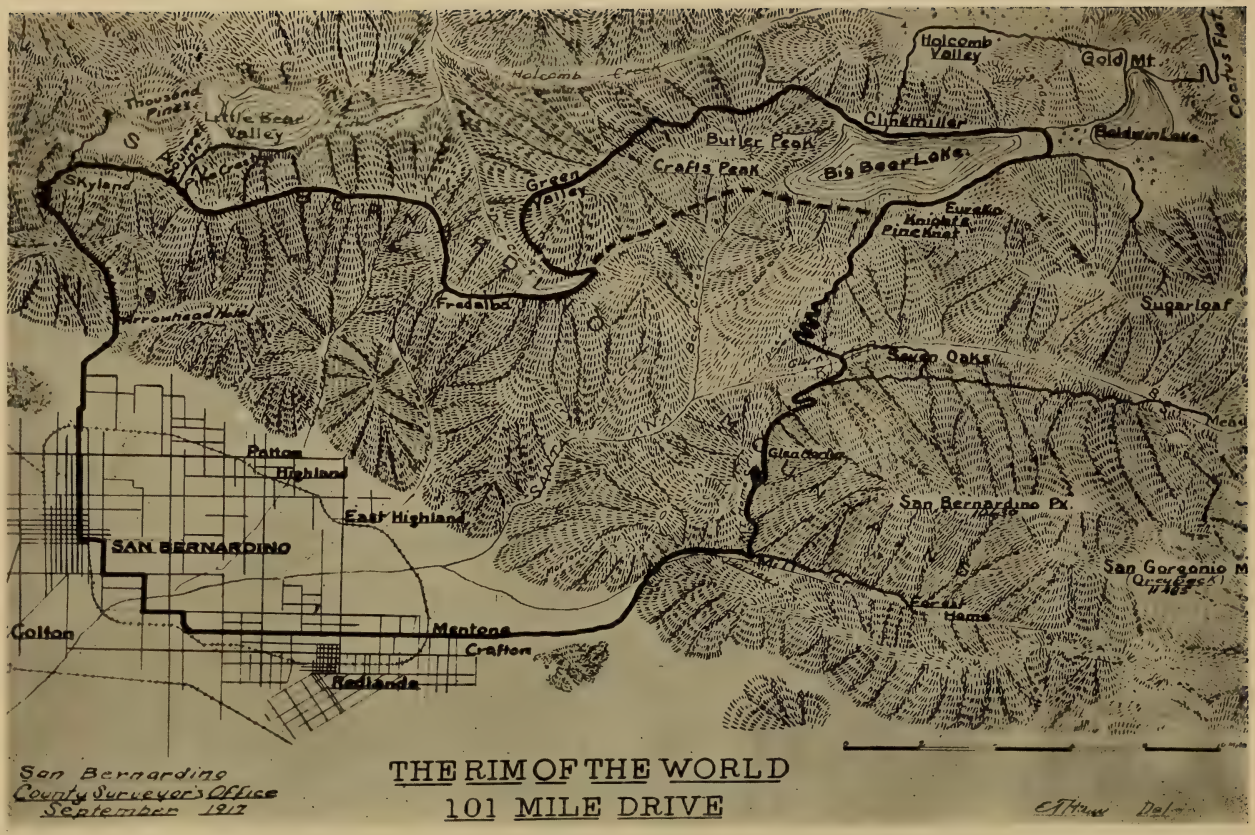
The State Highway route reaching from Kramer by way of Barstow to Needles is a project of the 1919 State Highway bond issue and will supply one of the main entrances into California for transcontinental travel. The loop north of San Bernardino is the 101 mile drive.

from point of production to rail head while in the Chino district is located one of the largest beet sugar factories in the state to which loads of sugar beets are hauled that test the highways as no other product of the county does. With a comparatively restricted area in which heavy hauling exists the road system built under the county bond issue has served well to meet the county's needs but in the area north of the mountains the existent road problems are sufficiently weighty to afford the Board of Supervisors much food for thought. For years one of these problems, the main one perhaps of the multitude which exist, has been the building of a road from Barstow to Needles to supply a comfortable entryway into California for a popularly traveled transcontinental highway over which, as road development takes place in the states enroute a constantly increasing volume of traffic comes to California each year. The distance between Barstow and Needles is 170 miles and it will be seen at once that the construction of this road would impose a burden upon San Bernardino County too great to bear. Realizing the need of this road not only to their own county but also to the state the San Bernardino County Board of Supervisors, when the matter of a new State Highway bond issue was proposed early in 1919, delegated one of its members, Mr. R. L. Riley, of Colton, to attend the meeting which was called to take place in San Francisco, and at this meeting the Barstow-Needles road was made part of the proposed state plan and one of the white man's burdens which San Bernardino County had borne for years was forever removed.

While popularly said to terminate at Needles the eastern terminus of this long stretch of desert road is at a point on the California line opposite the small Arizona town of Topoc, where a bridge across the Colorado river supplies one of the most interesting structures in the State road system. The expense of this bridge was borne jointly by the States of Arizona and California and the United States Commission upon Indian Affairs, the plans therefor being drawn in the office of Mr. J. A. Sourwine, the then county surveyor of San Bernardino County, Mr. J. P. Kemmerer,



Highway over Cajon Pass, the "Gateway into Southern California." Built by San Bernardino County and given to the state.



A noteworthy undertaking in scenic road development; originally a county project but now taken over by the State.

afterwards county surveyor and now a deputy in the office under county surveyor Edgar T. Ham, being responsible in large measure for their completion. In span the bridge is five hundred ninety-two feet in the clear with a total length of eight hundred thirty-two feet, forms the connecting link between the east and west over the Colorado river, and carries an ever increasing number of automobile parties lured to California by the spell of her good roads.

In charge of the current road problems of San Bernardino County is Mr. L. R. Lothrop, County Highway Commissioner, this office having been created by a county charter adopted in 1912 and in his work Mr. Lothrop has developed the plan of employing in road construction, men sentenced to the county jail for minor offenses, paying them 35 cents a day for their work. These men are well fed and housed and to their efforts is due the most striking of Southern California's many scenic boulevards officially designated as "The One Hundred and One Mile Drive on the Rim of the World" but popularly known as the "Hundred and One Mile Drive," originally built by San Bernardino County but now forming part of the State Highway.

Just how many miles of roads exist in this largest of California's counties probably no one knows; but the main traveled highways of the county from figures supplied by County Surveyor Edgar T. Ham, amount to 4331 miles consisting of 3475 miles of dirt roads, 330 miles of oiled dirt, 96 miles of oil bound macadam exclusive of the State Highway. That there will be constant increase in paved road mileage of San Bernardino County is assured by the Board of Supervisors which consists of J. B. Glover, Redlands, chairman; R. L. Riley, Colton; C. E. Grier, Upland; A. G. Kendall, San Bernardino; and A. B. Mulvane, Amboy, for these men are in perfect harmony with Road Commissioner Lothrop, County Surveyor Ham and his assistant, Mr. Kemmerer, all of them uniting in the belief that no better application can be made of county funds than to carry on the building of permanent highways.

CHAPTER XXXIV

SAN FRANCISCO CITY AND COUNTY

THE City and County of San Francisco, small in area and thickly settled throughout, with many manufacturing and commercial enterprises, which supply an enormous burden of heavy hauling, naturally finds its main traffic problems involved in the construction and maintenance of city streets rather than of roads.

These problems, it may be said, are being intelligently met and mastered, even the destruction caused by the fire and earthquake of 1906 scarcely seeming to interrupt progress; and compared with other big cities of the United States, San Francisco stands well up in its street development, having as well approximately 20 miles of purely scenic boulevards.

In so far as its boulevard development is concerned, however, the citizens of San Francisco may well be pardoned if they express enthusiastic pride, for, in spite of the limited area of the city, there have been scenic boulevards developed which compare favorably with the most famous of the United States—the Twin Peaks drive perhaps ranking above all others in variety of interest.

This highway supplies one of the most wonderful panoramic views to be had in California, while at the same time serving an economic need that alone has justified its entire expense in that it has supplied a direct and short-cut connection between the downtown business district and the western portion of the city, where, since the completion of this road, an extensive residential development has taken place.

A few years ago, to reach this section of the city, travel was compelled to take a circuitous northerly route over

View from Twin Peaks Boulevard. Market Street to right of center with tower of Ferry Building at shore line, Yerba Buena Island, beloved of sailor boys under the homely name of Goat Island, and beyond the Berkeley Hills.

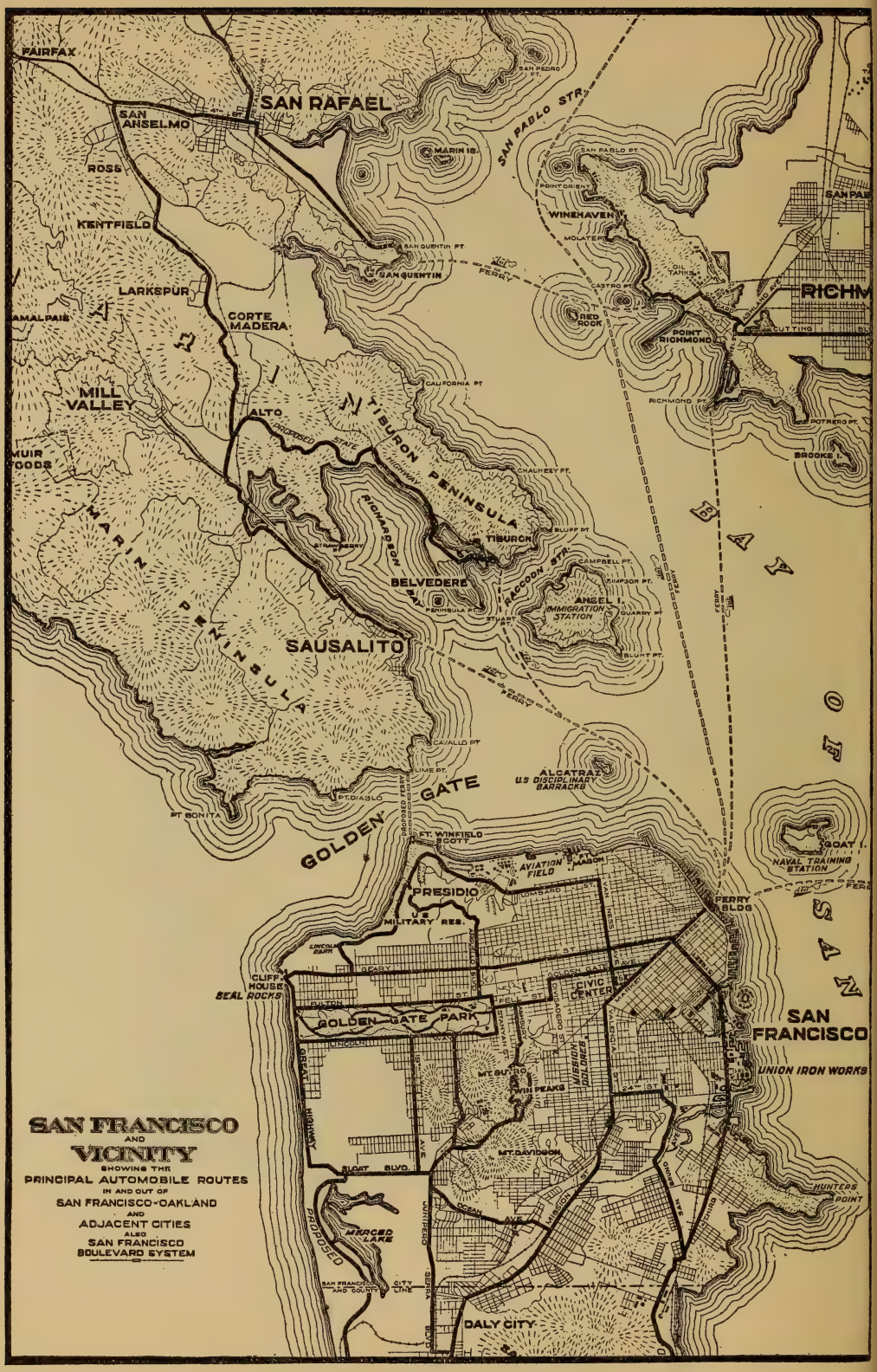
The Great Highway, San Francisco's ocean shore drive, showing width of completed pavement and protecting sea wall. Golden Gate Park in background.

Haight or Fell Street and Lincoln Way to Nineteenth Avenue, or a southerly route over Valencia and Mission streets and Ocean Avenue. Since the construction of the Twin Peaks Drive, however, the distance has been greatly shortened, the western part of the city brought into closer touch with the business district and made much more accessible therefrom for commercial traffic, while at the same time a stretch of touring road has been developed that climbs up and up to the very top of San Francisco's famous Twin Peaks, winds its way about them in a figure eight, and supplies a view that sweeps the horizon upon every side.

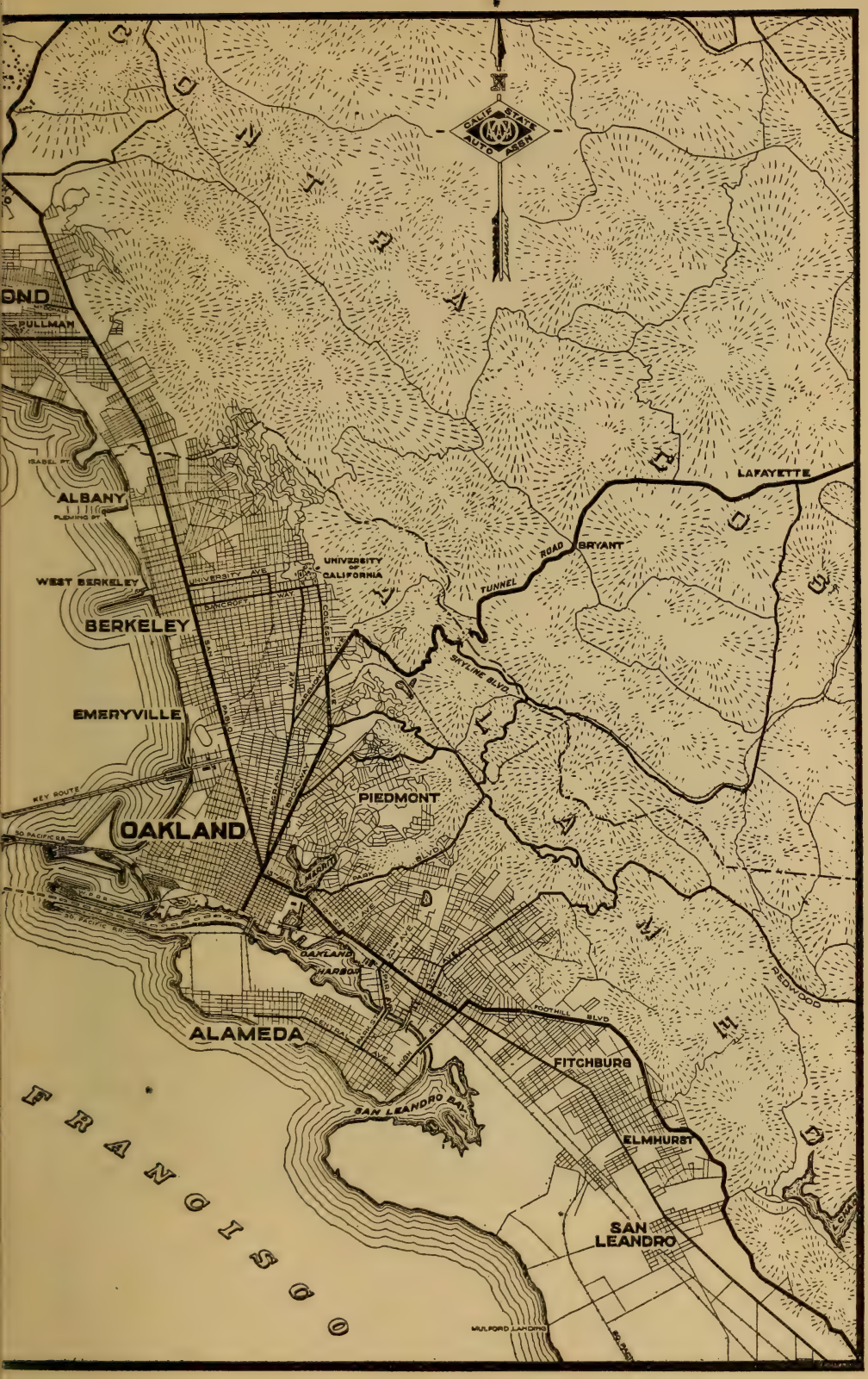
The man in the main responsible for this most spectacular drive is M. M. O'Shaughnessy, San Francisco's city engineer, who conceived the project shortly after he was appointed to office and was able, with the enthusiastic support of Mayor James Rolph, Jr., and Supervisor Thomas Jennings, at the time chairman of the finance committee of the San Francisco Board of Supervisors, to get sufficient funds to carry his plans into effect. Mr. O'Shaughnessy's principal assistants in dealing with the engineering details were H. W. Shimer and Clyde E. Healy.

Next in importance to the Twin Peaks drive is the Great Highway, that ocean-shore road reaching from the Cliff House and Seal Rocks to Sloat Boulevard. In conjunction with the Government's highways through the Presidio and the highways supplied by the Park Department in Lincoln Park, the Great Highway furnishes a drive which sweeps around the northern and western portions of the city and connects with the Junipero Serra Boulevard, which travels south to the eastward of Merced Lake into the beauties of San Mateo County.

In the development of the Great Highway the principal problem involved is in protecting the roadway from encroachment by the ocean, for the placid waters of the Pacific sometimes cease to be placid and pound upon the beach in such tremendous assault that a concrete sea wall set many feet down below the surface of the sands has become necessary. Part of this sea wall has been already built and as



This map shows the San Francisco boulevard system which is constantly being extended, the motor vehicle tax money allotted to San Francisco being employed in this work.



No attempt has been made to show the paved highway systems of adjoining counties, this map being intended to show the San Francisco boulevard system in detail and to emphasize the geographical location of the city by the Golden Gate.

funds are made available it is being extended, the highway being paved with concrete standard pavement as the wall is extended, and within a comparatively short time a modern smooth roadway with sea-wall protection will reach from the foot of the sheer rock wall below Sutro Park at the Cliff House to Sloat Boulevard. At the present time the Great Highway is surfaced and amply comfortable to drive over. This improvement being merely of a temporary character, and over it on a bright Sunday or holiday a tremendous volume of automobile traffic flows, supplied by the routes described as well as by the smooth driveways which John McLaren, superintendent of Golden Gate Park, has provided with the help of Curtis H. Lindley, Herbert Fleishhacker, John A. McGregor, M. Earl Cummings, and A. B. Spreckels, the Park Commissioners.

Development of the Hunters Point road is another undertaking which may well be regarded as a worth-while accomplishment, involving as it did the establishment of a roadway eighty feet wide of six-inch concrete base with two-inch asphalt wearing surface. This highway carries a heavy traffic burden, originating largely from the plant of the Union Iron Works, which contributed something like ten per cent of the cost of construction.

To discuss the roadways of San Francisco without touching upon the Skyline Boulevard provided for in the 1919 bond issue of the state, would scarcely be fair, for this project, involving the expenditure of state funds amounting to $2,741,000, originated in San Francisco.

A chance item picked up and printed in the *Municipal Record*, of which H. A. Mason was editor, to the effect that a highway along the top of the ridge which extended south from San Francisco would supply a wonderful scenic drive met the eye of Supervisor Richard J. Welch, who became interested, with the result that the 1919 Legislature passed a law permitting counties to associate themselves into a joint highway district for mutual benefit.

Under this law, Joint Highway District No. 1 has been organized by San Francisco, San Mateo, Santa Clara, and

Twin Peaks Boulevard. The highway forms a figure 8 around the peaks.

North end of Great Highway showing Cliff House and Seal Rocks. Cliffs in right background are topped by Sutro Park.

Santa Cruz counties, a Board of Directors appointed to govern its affairs being made up of Richard J. Welch, chairman, of San Francisco; John MacBain, San Mateo County; Frank E. Mitchell, Santa Clara County; and J. A. Harvey, Santa Cruz County; the secretary being H. A. Mason; and the engineering problems, so far as San Francisco is concerned, being in the hands of Mr. O'Shaughnessy. Starting in San Francisco from a point on the ocean beach near Sloat Boulevard, skirting the shore of Lake Merced, and traversing the counties of San Mateo, Santa Clara, and Santa Cruz upon the very peak of the ridge that extends to the south from San Francisco, the Skyline Boulevard will open up a new and attractive touring trip from San Francisco, make accessible a new and pleasing region for residential development, and also supply an alternative route to the State Highway, which is burdened with a mass of travel which is of such volume as to constitute an extraordinary and ever-increasing traffic congestion.

The money for the Skyline Boulevard, as has been said, is comprehended in the State Highway bond issue passed in July, 1919, the rights of way involved, however, being provided by funds raised by the highway district. These rights of way, in the fall of 1919, have been practically all provided, and active survey work is under way, even though the exact determination as to route has not as yet been made.

Standing back of this work and of all the highway and boulevard development plans in progress in San Francisco is the 1919 Board of Supervisors, made up of Cornelius J. Deasy, Andrew J. Gallagher, J. Emmet Hayden, Fred L. Hilmer, Oscar Hocks, John D. Hynes, John C. Kortick, Joseph F. Lahaney, Ralph McLeran, James B. McSheehy, Joseph Mulvihill, Charles A. Nelson, James E. Power, Warren Shannon, E. E. Schmitz, Fred Suhr, Jr., Richard J. Welch, and Edward I. Wolfe, and backing them is Mayor Rolph, who has done some mighty good things for San Francisco in the past and is going to leave behind him when he sees fit to retire from the leadership of the city that he has served a distinct impress of good civic accomplishment.

CHAPTER XXXV

SAN JOAQUIN COUNTY

This county is one of California's pioneer good-roads counties, having followed Sacramento and Los Angeles counties in voting bonds after a campaign conducted by the Stockton Chamber of Commerce, of which at that time J. M. Eddy, one of the old-time good-roads enthusiasts of California, was secretary.

The amount of the bond issue was $1,890,000; the year voted, 1909; the road system developed was laid out by R. M. Morton, detailed direct from Washington by the United States Bureau of Public Roads to assist in the improvement of the county highways, this being before the development of the United States Bureau of Public Roads into its present scope, with district offices located in various parts of the United States.

In considering the San Joaquin County bond issue it is well to remember that it was passed in those days when the concrete road, in California at least, was more or less of an unknown quantity; that the California Highway Commission had not yet come into being; and that the only counties which had passed bond issues had put down roads of oil-macadam or asphaltic type. So, naturally, San Joaquin County followed in their footsteps.

After the passage of the bonds and attracted by the climate or the road-building opportunities of San Joaquin County, Mr. Morton left the Government and having laid out the road system proceeded to build it, thus laying a foundation for what is today one of the most satisfactory examples of a radiating county road system in the state, which makes Stockton, the county seat, a large and rapidly

On the Jactone road. San Joaquin County was one of the first counties to undertake the plan of naming its roads.

San Joaquin County possesses one of the most extensive highway systems in California and has adopted the plan of designating each road by name.

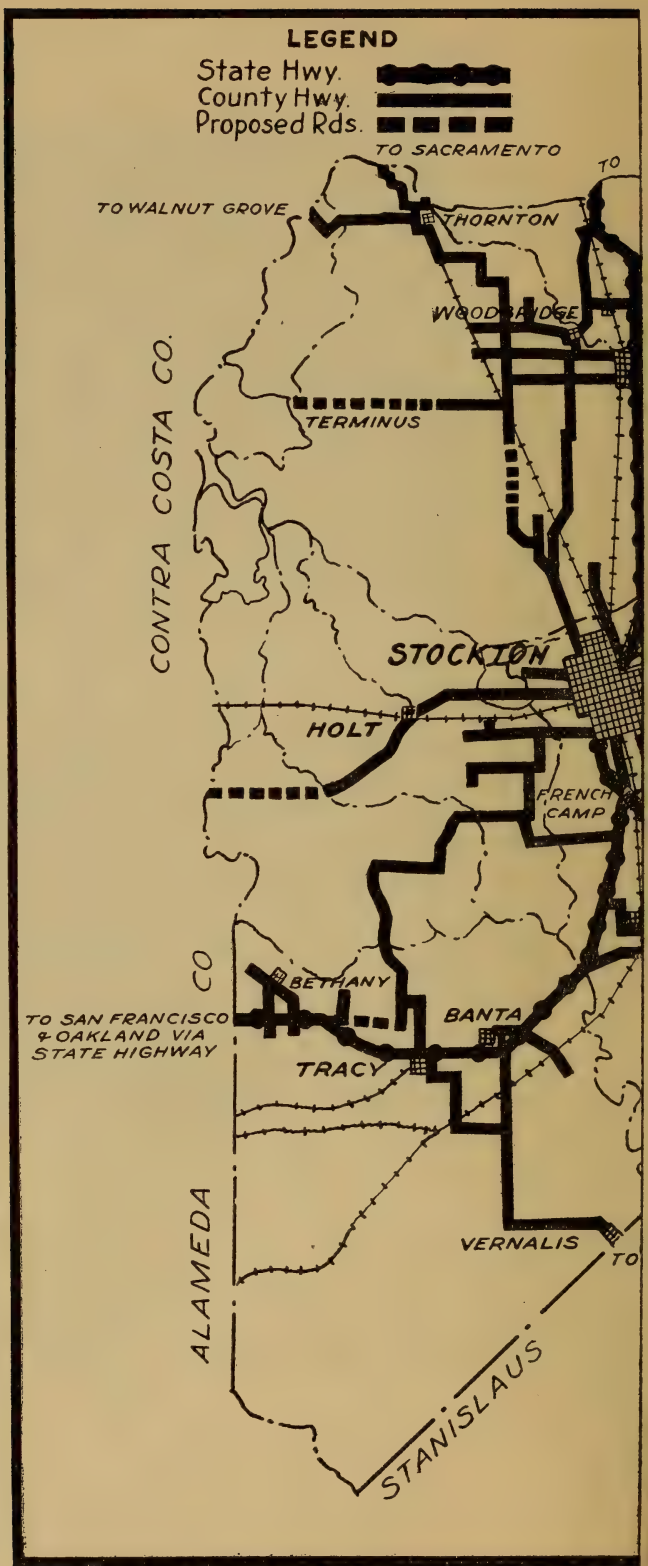
growing commercial and manufacturing center, the focal point of a network of highways which reaches fanwise into every part of the county.

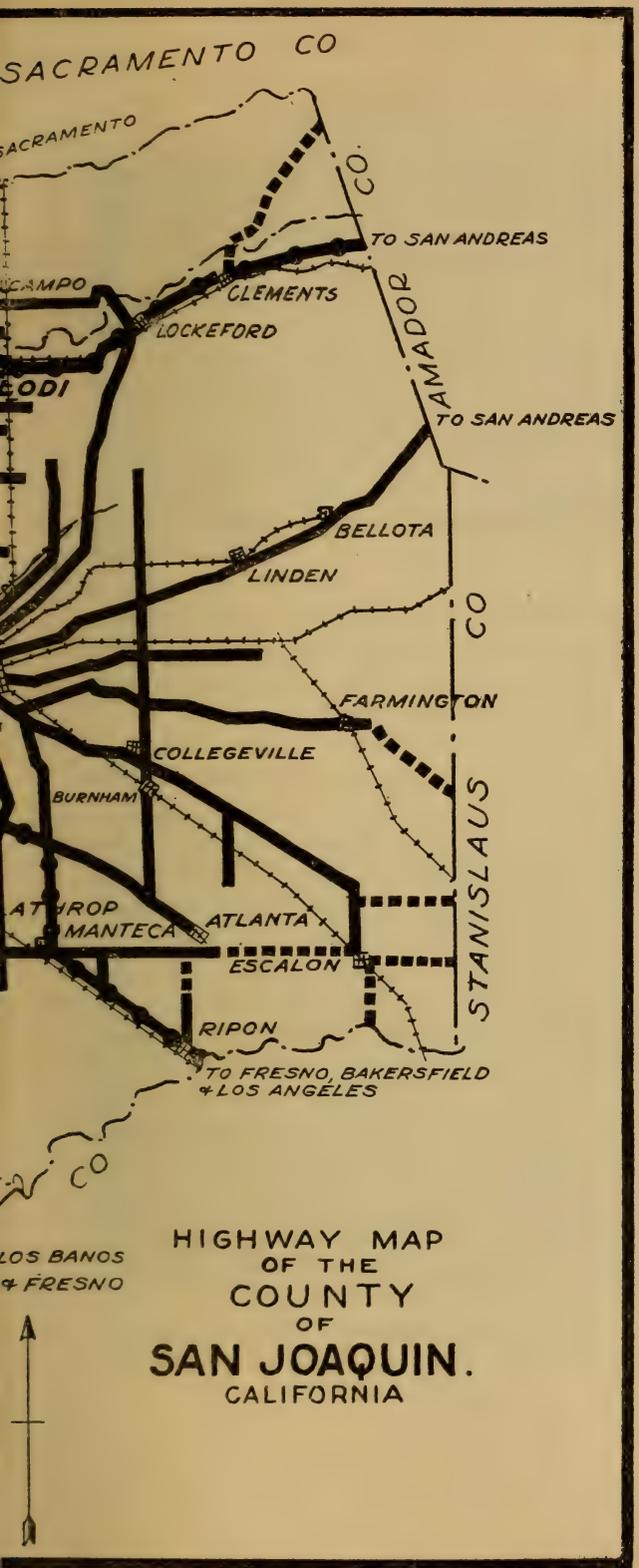
In the development of the San Joaquin County road system which today, including roads improved by the county and taken over by the State Highway, amounting to seventy miles, comprehends three hundred eighty-two miles of paved highway, roads were built up to the county line of all surrounding counties, these roads leading to Stockton and inviting much business thereto contrary to the peace of mind of business men in the nearby counties, the influence of the paved highways put in by San Joaquin County, which reached into the tremendously fertile and productive down-river section of Sacramento County around Walnut Grove, doing more to wake up the business men of Sacramento into a frantic effort to carry the 1916 Sacramento County bond issue than any other thing. In supporting this bond issue these men were urged into activity by the fact that many large dollars produced in Sacramento County traveled to Stockton over good roads, refusing to go to Sacramento over bad ones; half a million dollars a year being a conservative estimate of the amount thus tolled away.

In reviewing the road development of San Joaquin County it may be said that an enormous agricultural production takes place, the delta lands in the western part of the county having been diked with substantial levees and reclaimed, the soil being of sediment and peat, a sample sent to the St. Louis Exposition in 1904 being awarded a medal as the richest soil in the world, to the eternal satisfaction of the Stockton Chamber of Commerce.

Potatoes 100 sacks to the acre is nothing unusual for the delta section to produce, while 22 sacks of beans, 250 sacks of onions, 1200 dozen bunches of celery, and 25 sacks of barley are commonly grown. The mass of road tonnage thus supplied is further augmented by the fact that the city of Stockton, situated advantageously upon tidewater transportation, has grown into one of the most important jobbing and manufacturing centers in the state, the tidal rise at the

From Stockton through Woodbridge to Thornton a paved road has been supplied to the Sacramento County line, and much business has flowed over this road each year to Stockton merchants. This highway, connecting with a Sacramento County highway at Walnut Grove, supplies a cross-country route between San Joaquin Valley points, and the upper California Coast by way of the Rio Vista-Suisun road shown on the Solano County map on pages 254 and 255. The highway from Stockton to the west via Holt to the County line is the Borden Highway connecting with the Contra Costa County system, and furnishes an alternative route to San Francisco to that supplied by the State Highway. It is in process of development in 1919.





The San Joaquin County highways probably supply the best example of a radiating road system in the State, all centering in Stockton, which has drawn much trade from adjacent counties thereby. To the eastward the highways lead into the high Sierras and the old time mining region of California and carry a considerable burden of touring traffic each year. In addition to this touring traffic a tremendous tonnage of agricultural products is each year transported to Stockton, which is on tide water and ships a great volume of water borne freight each year. Constant road extension is the policy of the San Joaquin County Board of Supervisors.

head of Stockton Channel being three feet and the annual water-borne freight amounting to approximately 2,000,000 tons, much of which must travel over county roads in its journey from producer to consumer.

In relation to the State Highway system San Joaquin County has played an important part, the first chairman of the California Highway Commission being Burton A. Towne of Lodi, who also took an active part in the development of the county's road-building plans. The county is traversed from south to north by the main valley trunk line of the State Highway system, which reaches from Mexico to Oregon, diversion being had over a State Highway route which scales Altamont Pass and traverses Dublin Canyon for travel headed for San Francisco Bay from southern points; the entire stretch of State Highway in San Joaquin County being of oil-macadam construction, a donation from county to state, now in process of reconstruction and as rapidly as possible being supplanted with concrete.

Not satisfied with developing its own county system of highways San Joaquin County is engaged in contributing to the general road system of the state, a road reaching from Stockton to the northwest supplying direct access to the Rio Vista–Suisun-Fairfield link of the 1919 State Highway plan and affording a direct route for San Joaquin Valley residents to the upper reaches of the California coast.

Another road of similar state-wide importance is that known as the Borden Highway, which trends practically due west from Stockton, passes through a tip of Alameda County, and connects with the Contra Costa County road system joining the State Highway at Martinez and thence to Oakland over the highway which traverses the heights above Carquinez Strait and San Pablo Bay. This road, in so far as San Joaquin County's contribution thereto is concerned, is practically done and will supply when entirely completed a route alternative to and much more attractive scenically than the present Altamont-Dublin Canyon road.

In charge of the roads of San Joaquin County in 1919 are the Board of Supervisors, E. E. Tretheway, chairman;

San Joaquin County's highways are built for safety. Subway on Borden Highway protected from seepage by concrete walls.

Middle River bridge on Borden Highway west of Stockton.

The type of oil macadam employed in county highway construction in San Joaquin County is well shown in this illustration.

James Y. Coates, George M. French, J. W. Stuckenbruck, and James T. Ansbro, the county engineer, F. E. Quail, being executive officer, and his assistant, W. B. Hogan; and having started out with oil-macadam roads these men are building more, disregarding the example of practically all the other counties of California and maintaining stoutly their belief in and adherence to the type of road they have put in, exercising careful maintenance and having in the main a creditable system of paved highways.

To definitely bring the public into their confidence, in the fall of 1919 the Board of Supervisors appointed an Advisory Board made up of Burton A. Towne, B. S. Crittenden, D. W. Miller, Hilliard E. Welch, Edward Powers, and J. M. Bigger, representing every section of the county and with this committee to help is planning toward the extension of the already comprehensive system of roads.

In their road-building endeavors they are amply supported by the San Joaquin County Chamber of Commerce, which is especially interested in the development of the Borden Highway and has gone on record as favoring its immediate completion. This organization with directors and officers for 1919 made up of Karl C. Brueck, president; Willard E. Shepherd, first vice-president; H. E. Tharsing, second vice-president; J. M. Bigger, treasurer; John P. Irish, Jr., secretary; M. Davidson, Howard Hammond, Glanville Hart, Samuel Kohn, J. M. Kroyer, Charles B. Pearson, J. W. Pearce, L. H. Roberts, H. E. Threefall, and Captain Benjamin Waters is further interested in the development of the county system with the eventual plan in mind of making the beauty spots of the Sierras to the east as far as possible tributary to Stockton by the construction of paved roads. Into this section a State Highway lateral already leads from Woodridge to San Andreas, the country of Mark Twain's jumping frog, where are the Calaveras Big Trees, and with this state road to encourage them they are going ahead each year in that road development which in 1919 is so much a part of our California life.

CHAPTER XXXVI

SAN MATEO COUNTY

"San Mateo County," to quote a report of the California State Board of Agriculture, "is that part of the San Francisco peninsula lying between San Francisco County on the north and Santa Clara and Santa Cruz counties on the south. It is divided lengthwise by the Santa Morena ridge of mountains, which forms the backbone of the peninsula. This mountain ridge is the fertile and picturesque watershed of a region peculiarly adapted for homes of beauty and comfort on its eastern slope. Along the shore of San Francisco Bay are many miles of deep water reached by spur tracks from the main line of the Southern Pacific Railway and offering vast possibilities to manufacturers who desire cheap sites with excellent shipping facilities, some of the largest plants on the Coast being located at South San Francisco and Redwood City.

"On the west the descent to the Pacific is quick and abrupt, into a region occupied by farmers, dairymen, stock raisers, and lumbermen. The whole ridge is everywhere accessible and all more or less covered with oak and redwood.

"San Mateo County is the home of the artichoke and Brussels sprouts, the rolling hill country of its western shore showing thousands of acres under cultivation for these vegetables, the market for which extends from the Pacific to the Atlantic. All sorts of vegetables thrive in San Mateo County, the northern end seemingly being particularly adapted for their cultivation. The cultivation of flowers, also, both in the open and under glass, is a large and profitable industry. Seventy-five per cent of the flowers sold in San Francisco's world-famed street marts are produced in San Mateo County.

Stone wall and guard rail on Half Moon Bay Road.

Road along summit of San Pedro Mountains.

On San Pedro Mountain—County officers on a road inspection trip.

The violet beds of San Mateo, some of which are acres in extent, have long been a lure for tourists."

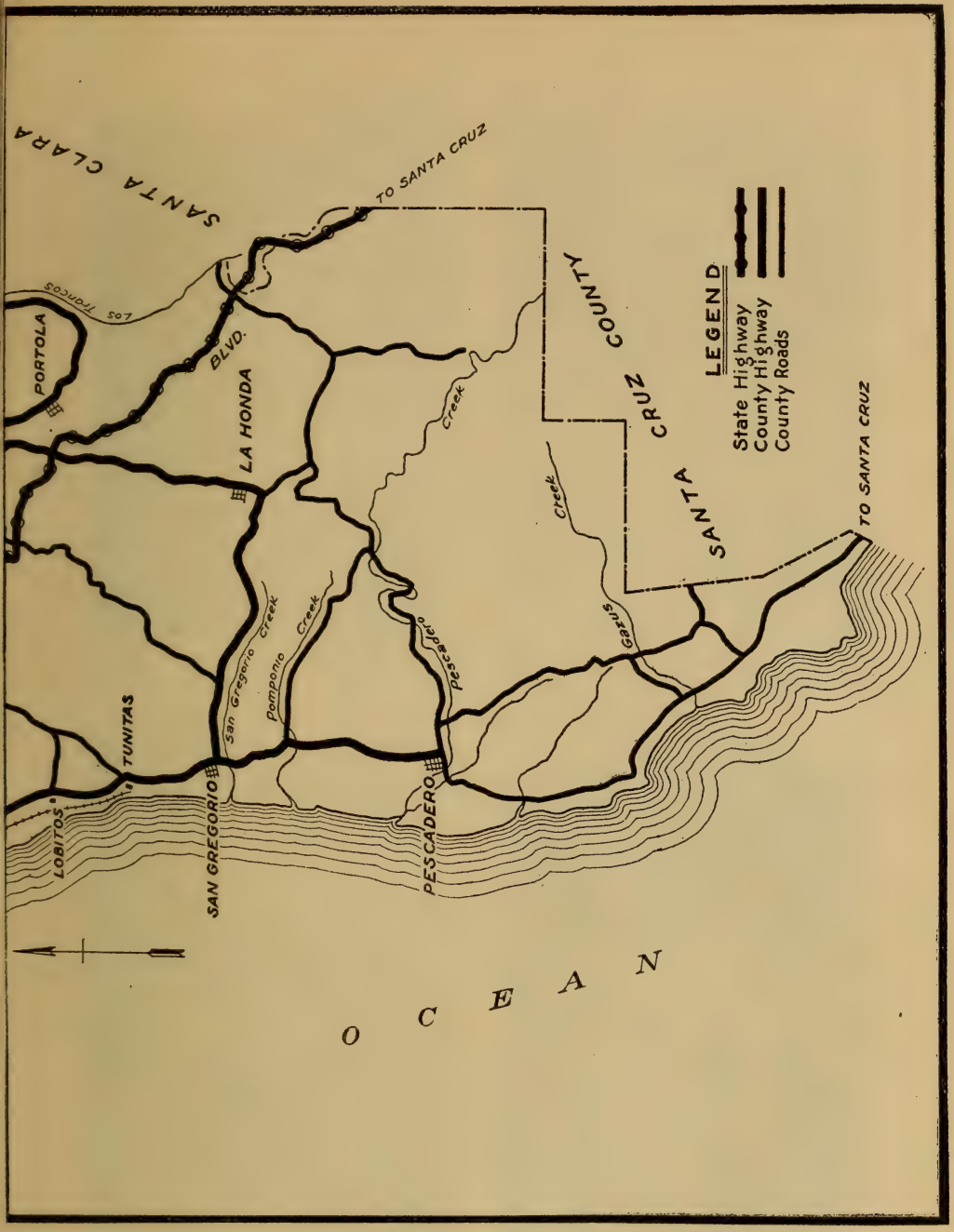
In thus commenting upon the resources of San Mateo County, the State Board of Agriculture failed to note that the upper part of the county is practically a suburb of San Francisco and that here many handsome homes and suburban estates have been developed by city folk of wealth who sought to take advantage of the equable climate and inspiring surroundings.

Supplementing the advantages touched upon, San Mateo County has a splendid system of highways that literally teem with automobiles on Sundays and holidays; and to the man who is unacquainted with the history of highway improvement in California it might seem that this county, above all others, would achieve good roads with a minimum of effort.

Such, however, was not the case, probably because San Mateo County pioneered the way in road improvement by a capitalization of county credit for all of the counties immediately tributary to San Francisco Bay, voting a bond issue of $1,250,000 in 1913 after a campaign that is still remembered by many as one of the most hard-fought in the state.

Credit for initiating the good-roads movement in San Mateo County is undoubtedly due the San Mateo County Development Association, which, immediately prior to 1913, had for its president Rev. W. A. Brewer, the vice-president and chairman of the executive committee being M. B. Johnson, afterwards elected to represent San Mateo, Santa Clara, Santa Cruz and San Benito counties in the California State Senate. Co-operating with these men was the following Board of Governors: S. D. Merk, W. J. Martin, Terry Masterson, Asa Hull, W. H. Brown, D. G. Doubleday, C. M. Morse, G. A. Deleau, Dr. C. L. Morgan, J. M. Custer, T. L. Hickey, A. J. Green, L. B. Behrens, and H. C. Teuchsen; while the Board of Supervisors, made up of J. T. Casey, Colma; W. H. Brown, San Mateo; P. H. McEvoy, Menlo Park; Jas. M. Francis, Half Moon Bay; and D. E. Black-

San Mateo County has a complete highway system built under its bond issue, but none the less is building more highways.



From Pescadero to the Santa Cruz County line is not as yet paved but plans for this work are being developed.

burn, Pescadero, when once it found that public sentiment was in favor of road improvement did all it could to help. The system developed took care of the needs of the county both from a commercial and touring standpoint, supplying the vegetable gardeners with smooth roads over which to haul their produce to market as well as developing a network of highways for automobile tourists the man in charge of construction being J. V. Neuman, then County Surveyor.

The most important of these roads, in all probability, was that stretch reaching north from San Bruno along the shores of San Francisco Bay through South San Francisco to the county line. This road supplies an alternative route to the State Highway without which a condition of traffic congestion of such gravity would undoubtedly exist as to warrant the declaration that the state road was so overloaded as to be actually unsafe.

Only less important in slight degree than the road last named is that stretch of highway trending south from Colma along the Pacific to the Santa Cruz County line, the bond issue taking care of this road to Pescadero, from which place south to the county line the road was improved by direct tax under a pledge that formed part of the bonding plan.

Between this coast road and the State Highway two lateral roads were supplied under the bond issue, the northernmost of these being known as the Halfmoon Bay road, which connected Burlingame, San Mateo, and Belmont by a direct road to the coast, and the southernmost reaching from Redwood City by La Honda to San Gregorio, both of these roads being of great scenic attraction and vast popularity with automobile tourists.

In so far as the coast road is concerned it may be said that San Mateo County, under its bonding plan, supplied a link in a coast road that will some day reach from Oregon to Mexico; for along the ocean shore county after county is falling into line and either planning or actually building additional shore-line links in those places where the State Highway runs inland, two new roads provided for by the 1919 state bond issue—the Carmel–San Simeon road, in

In La Honda Woods.

Between San Mateo and Half Moon Bay.

Coast road near Pescadero.

On San Gregorio-La Honda Road.

Bay Shore Road into San Francisco.

Near Half Moon Bay, showing type of guard rail used on bridges.

Monterey and San Luis Obispo counties, and the Oxnard–San Juan Capistrano road, through Ventura, Los Angeles, and Orange counties—practically completing the coast road from San Francisco to the Mexican line; while north of San Francisco Bay, Marin County is planning its link in the coast highway and Sonoma County has already voted its link, leaving only Mendocino and Humboldt counties to do their share in order to bring this road, long dreamed of by good roads enthusiasts, into actual reality.

That San Mateo did a good job in road building after doing an excellently good job in campaigning is part of California's road-building history, the road mileage achieved being 150 miles, including the special-tax road from Pescadero south, the roads bearing the heaviest travel being of concrete construction with the purely touring roads of oil macadam, the expense of establishing engineering grades, especially along the coast road, being exceptionally heavy.

In the building of the bonded system an advisory committee was named by the Board of Supervisors, which was made up of M. B. Johnson, chairman; George Perham, and Jesse Robb; and, following the example furnished by them, the various San Mateo County Boards of Supervisors have continued to extend the system, a stretch of concrete road twenty feet wide with one and one-half inches of Topeka surfacing reaching into South San Francisco from the State Highway illustrating well the ideals toward which they are working; and of the 1919 Board of Supervisors, which is composed of John MacBain, chairman; Thos. L. Hickey, William H. Brown, Joseph M. Francis, and Dr. C. V. Thompson, it may be said that with the advice of the 1919 County Surveyor, George Kneese, they are developing and have developed the county's road system until today it takes in 150 miles and puts San Mateo County in rank with the most progressive counties of the state, their endeavors in relation to getting the Skyline Boulevard put into the $40,000,000 State Highway bond issue having no little to do with its success.

CHAPTER XXXVII

SANTA BARBARA COUNTY

The attitude of the people of Santa Barbara County in relation to highway improvement may best be expressed, perhaps, by stating that in 1915, in order to supply bridges for the State Highway which was then in process of construction, a bond issue of $350,000 was voted since which time additional money has been supplied to the state until, in 1919, the total contribution approximates half a million dollars.

In this undertaking Messrs. George M. Williams and F. E. Kellogg of Santa Barbara with the late Hugh Kelly of Santa Maria were the commissioners appointed to see that a proper application of the funds was made, these men working in conjunction with the Board of Supervisors of Santa Barbara County which at the time was made up of C. K. Hardenbrook, chairman, of Lompoc; H. J. Doulton, Santa Barbara; F. C. Twitchell, Orcutt; H. S. Deaderick, Carpenteria; and A. W. Conover, Goleta.

The principal State Highway bridges, made possible by the funds raised by Santa Barbara County, are the Arroyo Quemada bridge, four hundred twenty-five feet long and seventy-seven feet in height, costing about $41,000, the Arroyo Honda bridge, six hundred twenty-five feet long and seventy-five feet high which involved the expenditure of $100,000, $40,000 being supplied by the county, and the Santa Ynez River bridge, a steel structure with concrete floor having seven steel spans of one hundred sixty-two feet each with concrete approaches, costing $175,000 of which Santa Barbara County supplied $50,000, the cost of Arroyo Quemada bridge being borne entirely by the county which

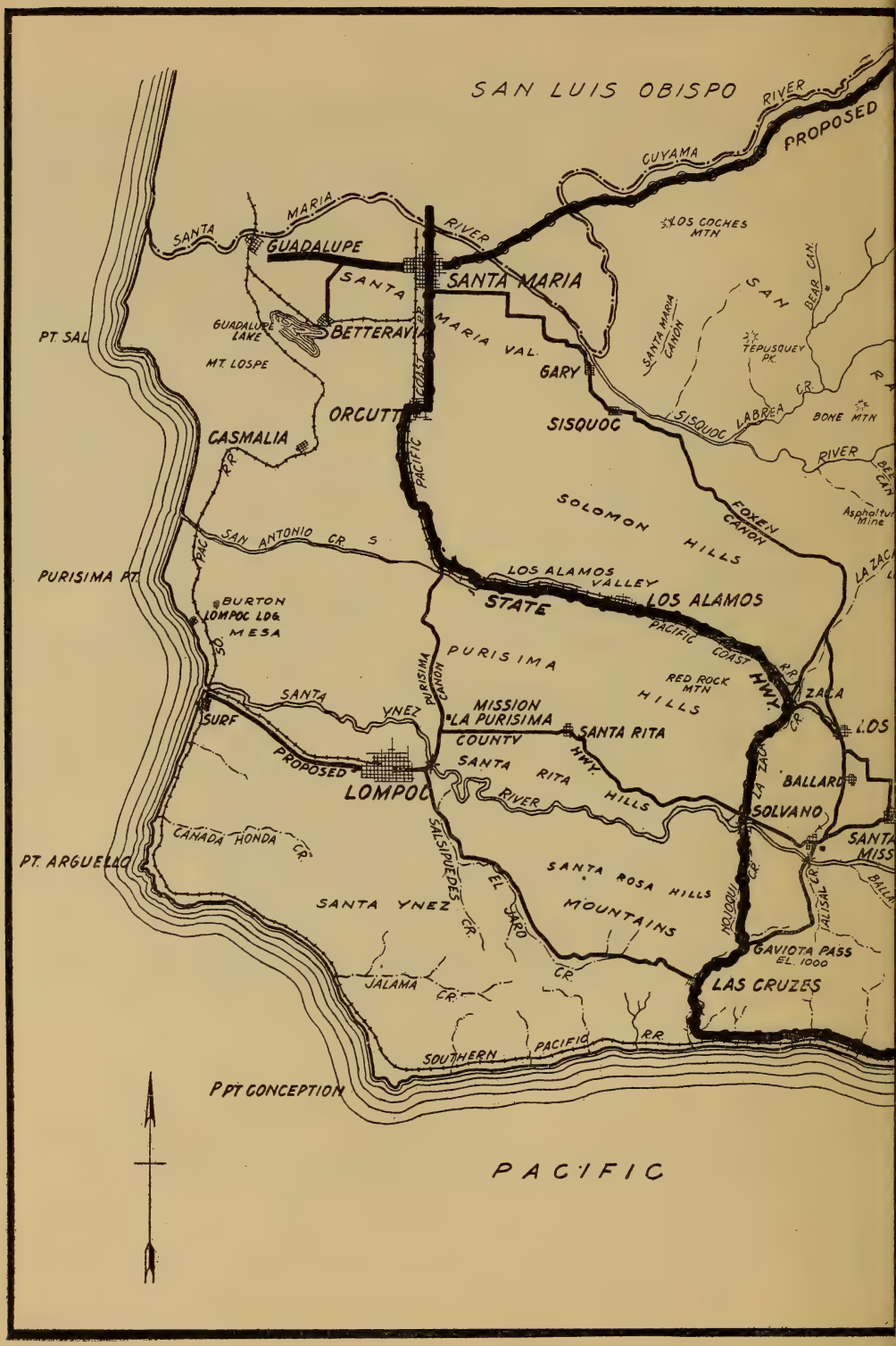
On the State Highway looking north into Santa Barbara County from the Ventura County line. The bell on right is one of the emblems marking El Camino Real, the King's Highway of the Spanish Padres.

Concrete highway built by Santa Barbara County Board of Supervisors.

also, subject to the approval of the State Highway engineers, furnished the plans.

Not content with the contribution set forth above to the State Highway system and perhaps believing that the sooner the coast route highway from San Francisco to Santa Barbara was completed the sooner would Santa Barbara County begin to derive material benefits therefrom the people of the county, through the Board of Supervisors bought $694,074 State Highway bonds and resold them at a loss, supplied about $100,000 worth of rights of way and fencing and then turned to and built twenty-two and one-half miles of asphaltic pavement of the best possible type and presented it to the state. With a contribution of money in the amount stated serving to emphasize the attitude of the people of this county in relation to good roads, it is almost surprising to find that a bond election to supply a county-wide system of highways failed to carry in 1915 by a few votes, but this fact did not in the least deter the Board of Supervisors from going ahead and doing the best they could with the limited funds at their disposal and in the past three years they have managed to put down seven miles of the best type of concrete construction, twenty-four miles of oil macadam and nine miles of asphaltic type, a total of forty miles of paved highways, doing high finance to get a little bit of money here and a little bit of money there, resolved at least to make a start.

In addition to the forty miles of paved roads already laid down by the Board of Supervisors an additional twenty-five miles of paved road is being planned by Supervisor J. T. Torrence around Santa Ynez, Los Olivos and Solvan, while in the Carpenteria and Montecito districts Chairman H. S. Deaderick is planning to build fifteen miles. Around Santa Barbara plans for an extension of the system already put in are being forwarded by Supervisor Sam J. Stanwood under what is known as the road district improvement act which permits the formation of road districts upon petition of the people resident therein and the issuance of bonds to build permanent highways. Around Lompoc, in the northwestern portion of the county, Supervisor J. T. Frick has in develop-



The State Highway through Santa Barbara County from San Luis Obispo County to Ventura County is all paved. The highway shown reaching inland from Santa Maria is the Cuyama Lateral and is merely surveyed.

Map data furnished by courtesy of Owen O'Neill County Surveyor

Most of the paved roads built by Santa Barbara County are near Carpinteria, Summerland, Montecito and Santa Barbara and cannot be properly shown on a map of this size.

ment plans for twenty-eight miles of paved highways while in the northern part of the county Mr. C. L. Preisker, supervisor in that district, has done some very creditable road building between Guadalupe and Santa Maria and has also definite plans looking toward the construction of yet more concrete roads.

The Cuyama road is a highway long dreamed of by the people of the northern part of Santa Barbara County which connects Santa Maria in Santa Barbara County with the already built highway system of Kern County at a point near Maricopa, following in a general eastwardly direction the windings of the Cuyama River through a country where road building is expensive in the extreme, and was included in the 1919 State Highway bond issue mainly through the efforts of the Board of Supervisors, the Santa Barbara Chamber of Commerce also giving able help through its secretary, George Wight.

In order to carry out the plan the Boards of Supervisors of Santa Barbara and Kern Counties have formed a joint highway district and will, with the assistance of the State, undertake the development of the Cuyama road as a joint enterprise, the highway district formed being officially designated as Joint Highway District II.

In the development of a road plan for Santa Barbara County it may be said that the Board of Supervisors is governed to a great extent by the fact that this section has come to be known as a place where one of the most ideal climates in the United States exists. As the result of this fact wealthy people from all over the country gather here, some of them to escape the rigors of the Eastern winter, merely tarrying for a few months, while others have bought more or less extensive acreages and built homes costing hundreds of thousands of dollars for permanent occupation. With a citizenship of this character the building of pleasure drives becomes of great importance for so keen is the competition among the counties of Southern California for that winter travel which measures up into millions of dollars each year that the county without good roads falls far behind.

Santa Barbara County furnishes a splendid example of well planned and consistently carried out highway tree planting.

This stretch of State Highway was paved by Santa Barbara County and presented to the State.

Following this policy the roads of Santa Barbara County, especially around Santa Barbara, Montecito, Carpenteria and Goleta have been developed into attractive pleasure drives and here one road particularly compares favorably with any scenic boulevard in the state. This road, built mainly by the city of Santa Barbara, although due in part to county aid, climbs up the hills to the north of Santa Barbara in ever increasing height until, at the summit one of the most wonderful views to be had in California is disclosed. Spread flat below, far down and seeming like some Lilliputian village, is Santa Barbara with its great hotels, handsome homes and tree-lined streets while beyond in the blue flat of the ocean, San Miguel, Santa Rosa, Santa Cruz and Anacapa Islands float a few miles off the coast. To the east are Carpenteria and Montecito hid almost in the heavy foliage of the trees while to the west the curving shore line dims into the distance measured by high bluffs thrusting out into the sea.

That other road problems than those dealing with the development of a purely scenic boulevard system confront this county may be grasped when it is known that in the different valleys, Goleta, Santa Ynez, Buell Flats, Alamo Pintado, Los Alamos, Lompoc and Santa Maria an extensive road tonnage of soil products is produced and in the future road development of the county not only must the scenic aspect of the county be considered but also its rapidly developing agricultural needs must be met.

CHAPTER XXXVIII

SANTA CLARA COUNTY

DIRECT-TAX road building in this county prior to 1919 had supplied 97.30 miles of paved highways, paid for as they were built, with no following debt to be taken care of, the road-building program of 1919 providing for twenty miles more.

It may be said that the Board of Supervisors of Santa Clara County to a man believe in road building by the methods they have pursued, which are made possible by the fact that Santa Clara County property owners pay their taxes promptly and can raise each year, with little tax increase, sufficient funds to build an appreciable mileage of expensive roads.

These men, entitled to mention as a result of their road-building accomplishments, are: John Roll, Santa Clara, chairman; A. L. Hubbard and Henry M. Ayer, San Jose; Henry Hecker, Gilroy; and Frank E. Mitchell, Saratoga.

Of the roads already built 46.8 miles are of concrete, four inches thick, sixteen feet wide, with one-and-one-half-inch surfacing of asphaltic concrete, except one and one-half miles which has been paved with brick upon a four-inch concrete base, this mileage of brick road being the only example of such paving put in by any California county so far as is known and supplying a type of road building that the traffic of years to come will scarcely mar.

In addition to the concrete road mileage, 50.5 miles of heavy oil-macadam construction has been laid down, which type of pavement is proving very satisfactory on roads that do not bear a volume of traffic made up of heavy units; but it may be said that the Santa Clara County Board of Super-

Lick Observatory on Mount Hamilton showing road to top.

A neighborhood road of oil macadam in the orchard section

A Santa Clara orchard in bloom. Highway in left background.

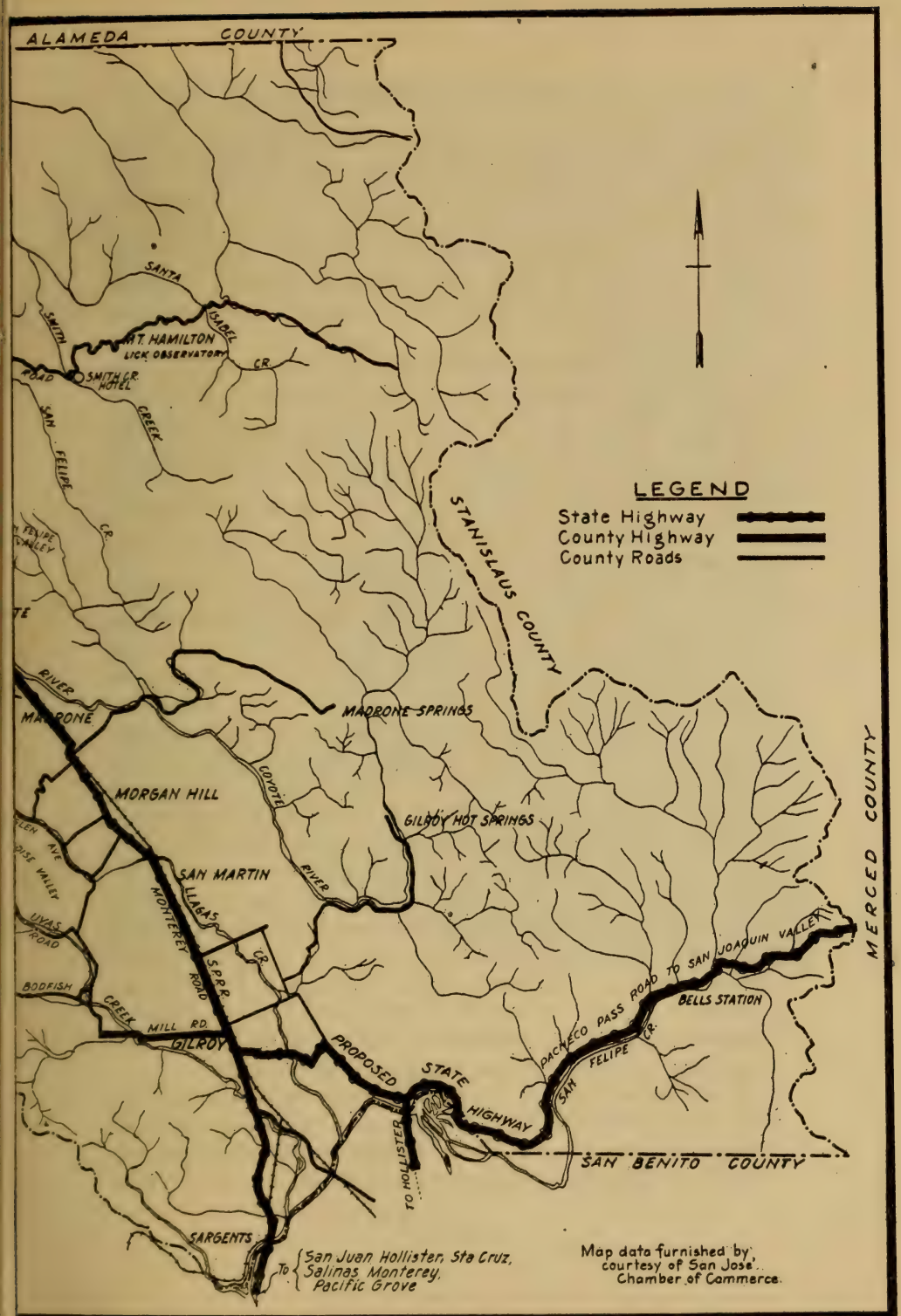
visors is convinced that for heavy traffic their constituents, or at any rate a large proportion of them, want concrete roads, which they are now getting and of which they are to have more, as the plans now in contemplation provide for a comprehensive system of county highways of absolutely the best type; the man charged with the development of this system being Irving L. Ryder, county surveyor, who is a believer in the concrete road of proper cement mixture to form the most stable base with such surface treatment as will best withstand the continuing wear of iron-shod traffic.

In regarding the road needs of Santa Clara County a two-fold aspect is presented, the varied crop production supplying a huge road tonnage moved each year to market or shipping point, 60,000 tons of dried prunes being a fair average which goes forth from the beautiful Santa Clara Valley each year to breakfast tables all over the world, while about 10,000 tons of dried apricots are also each year moved over the roads. Dried peaches in the amount of approximately 1500 tons also form part of the annual road burden, as do several hundred tons of pears and nuts, while wine and table grapes amount to more than 30,000 tons.

Only slightly less important than the commercial traffic which the roads of Santa Clara County bear is that pleasure travel which, with the cheapening of the automobile, has increased so tremendously of late years. Of this travel Santa Clara County invites and secures its full share, which is poured in by the State Highway from San Francisco and Oakland, two main trunk line highways originating at these points converging at San Jose, the commercial center of the county, into one main trunk line that reaches the cities and valleys to the southward by way of the Coast route.

Of the pleasure traffic which passes through Santa Clara County there is a definite and natural diversion, for many points of interest exist made easy of access by county highways. Principal of these is the famous Lick Observatory, the gift of James Lick, one of California's pioneers, whose will set aside $700,000 for an observatory to be equipped with the finest and most powerful telescope obtainable.

With the exception of the Sky-line Boulevard and the Pacheco Pass route of the State Highway all highways shown are completed.



All of this highway development in Santa Clara County has taken place by direct tax and by use of current road funds, Santa Clara County being the one county in California that has developed a comprehensive paved highway system without voting bonds.

This observatory, perched upon Mount Hamilton only a few miles from San Jose, is 4209 feet above sea level, and in one of its supporting columns is the tomb of the donor, whose bequest, among other conditions, provided that the county should build a good road to the mountain's top. This has been done and a smooth, wide, though unpaved, highway provided which does not exceed six per cent in its maximum grade.

One of the highways now being developed by Santa Clara County which promises to equal in importance the Sunnyvale-Los Gatos concrete highway is that known as the Bodfish Mill Road, which extends in a general westwardly direction from Gilroy, in the lower part of the Santa Clara Valley, to the Santa Cruz County line. In the development of this road the Santa Clara County Board of Supervisors is operating under agreement with the Santa Cruz County Board, which plans, in time, to extend the road to Watsonville, forming a short-cut connection between the important towns named as well as supplying the final link in that long-dreamed-of Yosemite-to-the-Sea Highway which drops down from the Sierras, crosses the San Joaquin Valley, and climbs over the famous Pacheco Pass—one of the lateral roads now being planned by the State Highway Commission.

Of the scenic roads of Santa Clara County, that to the California State Redwood Park is of national importance, reaching into a wonderland of big trees and primeval forest popularly known, because of its geological formation, as the "Big Basin." Paved county roads from San Jose, Santa Clara, Mountain View, Palo Alto, and Los Gatos center at Saratoga, whence, by way of the state road from the summit, entrance is had to the park. From Saratoga to Long Bridge, a distance of three miles, the Santa Clara County Board of Supervisors is now permanently improving this road, three important concrete bridges being already installed.

In the movement for road development in this county the San Jose Chamber of Commerce, of which Joseph M. Parker, of the Sperry Flour Company, is president and Joseph T. Brooks is secretary, has taken an active part.

The Alum Rock Road. One of the few brick county highways in California

At a Santa Clara County packing house in the fruit season showing character of road tonnage.

William S. Clayton, president of the First National Bank of San Jose and for years chairman of the Highways Committee of the Chamber of Commerce, has also been a consistent worker for better county highways. In addition to his interest in the road plans of Santa Clara County, Mr. Clayton has taken an active part in the upbuilding of the State Highway and was one of the men instrumental in getting the various counties to purchase State Highway bonds with funds taken from the county treasury when construction work, under the first State Highway bond issue, was at a standstill because the bonds could not be sold at par.

Other men who have participated in the road development of Santa Clara County are Dr. W. C. Bailey, City Manager of San Jose, and Charles R. Parkinson, E. N. Richmond, R. F. Benson, and Howell D. Melvin, all of San Jose; while David C. Bell of Saratoga, J. D. Farwell of Los Gatos, and S. E. Johnson of Cupertino also have been active.

These men, believers in the good road as a modern economic necessity, have set aside personal interest upon every occasion when their services were needed and are working with the County Surveyor and the Board of Supervisors to give truth to the county slogan which declares that every main-traveled road in the county will some day be a paved highway.

Including the State Highway 160.62 miles of paved highway exist in Santa Clara County, there being in addition more than 1000 miles of roads not permanently paved but well kept up and pleasant for travel. Throughout the county the different chambers of commerce and improvement clubs have participated in road betterment continuously, and among its citizens, distinguished for his splendid service in the road-building history of the state, Santa Clara County is proud to number Charles D. Blaney of Saratoga and San Jose, chairman of the California Highway Commission in its most trying period, who more than made good.

CHAPTER XXXIX

SANTA CRUZ COUNTY

SANTA CRUZ COUNTY, situated only about seventy miles south from San Francisco, is widely known as one of California's most popular playgrounds, offering not only ideal stretches of beach for those who prefer sea bathing, fishing, and other ocean-shore attractions, but also almost innumerable nooks where hundreds of summer homes have been built on the slopes of the Santa Cruz Mountains.

With a State Highway lateral reaching into Santa Cruz County from San Jose, by way of Saratoga, and the main trunk line of the Coast Route only a few miles to the eastward of the county line, access is easy, and a flood of automobile touring traffic, increasing each year in volume as the highways have been brought into more perfect improvement, has poured thousands of visitors into the county during the summer season.

In addition to the touring traffic imposed upon the county roads by the two lines of the State Highway, a heavy volume of hauling has developed within the county as the result of the extension of the apple-growing industry, which centers at Watsonville, the packing and shipping point, to which place in season thousands of wagonloads of apples are moved from the orchards which dot the Pajaro Valley.

In considering the work of road development in Santa Cruz County it is only fair to say that had it not been for the entry of the United States into the war the bond issue to provide $924,000 for road construction which was triumphantly passed on June 10, 1919, would have been voted long before, for at no time since its appointment, more than two years ago, has the County Highway Commission, made

The Cliff Drive looking toward the city of Santa Cruz. Paved in part this scenic drive is to be further improved.

View looking toward Santa Cruz from Country Club. On the Boulder Creek road which is being paved with concrete in 1920.

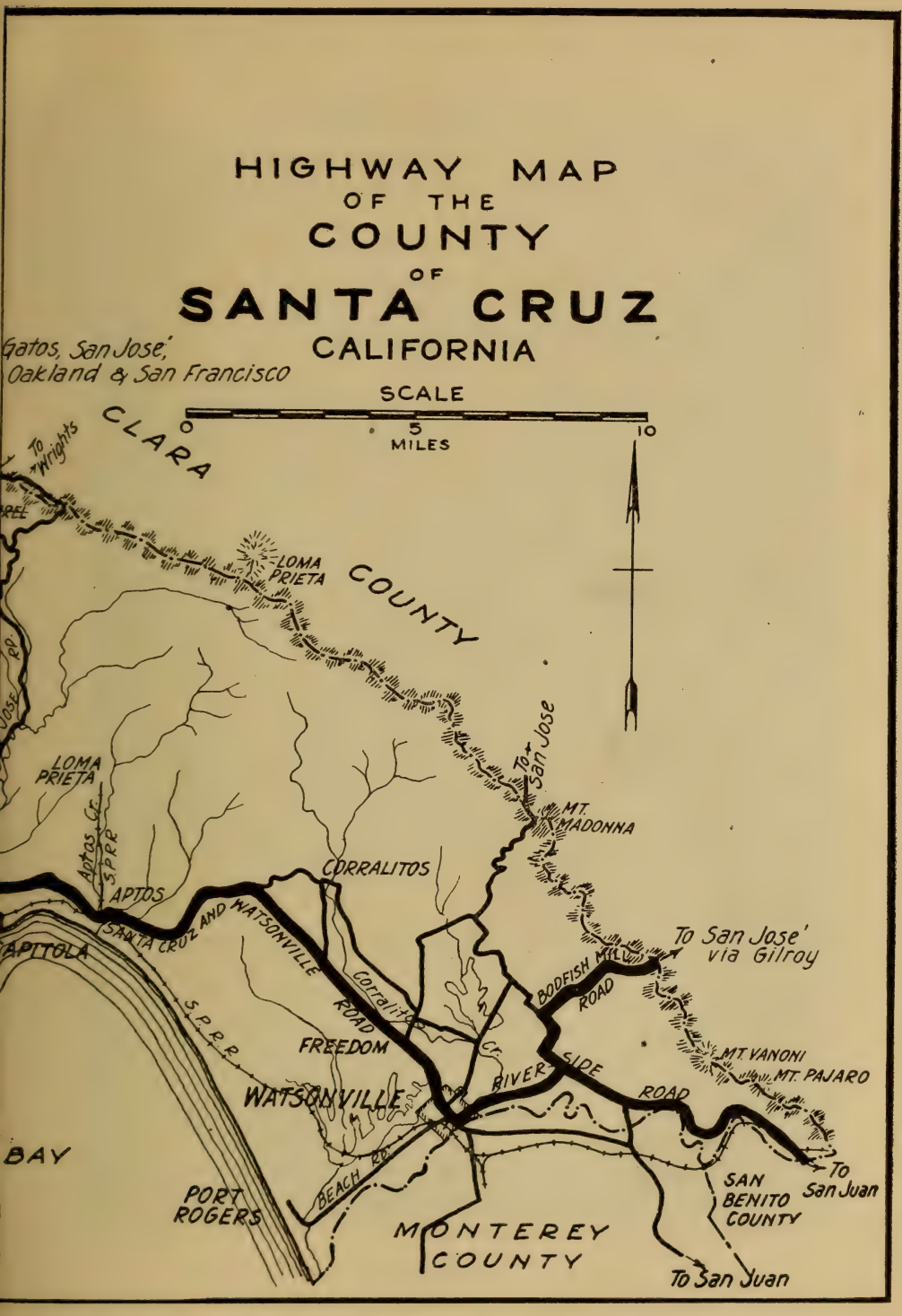
up of W. S. Moore, chairman, and C. D. Hinkle of Santa Cruz and J. B. Milks of Watsonville, faltered in determination to provide Santa Cruz County with such a road system as it undeniably should have.

By reference to the accompanying map it will be seen that the plan under construction provides one main highway which passes practically through the county from southeast to northwest, connecting Watsonville, Aptos, Soquel, Santa Cruz, Felton, Ben Lomond, Brookdale, and Boulder Creek and forming a paved connection at Santa Cruz with the State Highway lateral which traces its way over the Santa Cruz Mountains from San Jose by the way of Los Gatos, thence to the San Benito County line on the east, from which point to the Coast Route of the State Highway is only a matter of a few miles, which the California Highway Commission has promised to pave when Santa Cruz County gets its own road system in.

This line of the county highway system, passing through both Watsonville, the center of the apple-growing industry, and Santa Cruz, the county seat, will undoubtedly for all time to come bear the heaviest burden of traffic in the county, for not only are apples produced in profusion but also berries of different kinds supply no little road burden, while different kinds of vegetables, produced in quantity on the rich alluvial soil, both around Watsonville and Santa Cruz, are hauled over the roads to shipping points or market during a good part of the year, the strawberry season, for instance, continuing for about eight months; while the dairying industry also supplies a definite road tonnage that is growing in volume, some of the dairies in the county milking as many as three hundred cows. In addition to the fruits, berries, dairy products, and vegetables produced, all of which require smooth highways to reach market in satisfactory condition, the poultry industry, which has been developed into extensive proportions in the last few years, particularly around Santa Cruz, supplies one more, and it may be said an excellent, reason for paved highways.

At Boulder Creek, where the county highway system

Santa Cruz County has received liberal treatment from the state, the Scott's Valley highway being practically complete while that stretch from Boulder Creek through Redwood Park and the Sky-line Boulevard are planned for early construction. From the eastern end of the county system the state has promised to build to the coast highway, a matter of three or four miles.



The county system is under construction in the latter part of 1919 with the exception of that route shown along the coast which is to be built by direct tax and out of other supplementary funds. This coast road, connecting with an established road put in by San Mateo County, which is fairly well paved, supplies one of the most attractive drives near San Francisco and will some day form a link in an all-coast road from the Golden Gate to Mexico in connection with the Carmel-San Simeon stretch of the State Highway.

terminates at its northern and western end, connection is made with a line of the State Highway which reaches into California Redwood Park, a state reservation popularly known as the Big Basin, and through it to the Santa Clara County line, whence a road is being planned to connect with the Santa Clara County system at Saratoga.

Not comprehended in the road plans of Santa Cruz County which are under the jurisdiction of the Santa Cruz County Highway Commission, but only less important in small degree, if at all, are two stretches of road which the Santa Cruz County Board of Supervisors has definitely decided to improve with pavement of the best and most modern type. The most important of these, beyond question, is that running up the coast from Santa Cruz and connecting at the San Mateo County line with the established road system of San Mateo County. In scenic attraction this road, tracing its way close up to the breakers which pound the shore, is of unusual interest and no more attractive reach of California's rugged coast line is anywhere to be seen than here. This road will undoubtedly in the future form a link in a paved highway along California's coast from Mexico to Oregon.

From Watsonville another road is proposed which trends east of north connecting with the Santa Clara County road system and supplying in comparison with the State Highway a short cut into Santa Clara County from Watsonville.

In the development of these two roads, the Santa Cruz County Board of Supervisors, made up of James A. Harvey, chairman, and George H. Rostron, both of Santa Cruz; N. P. Sinnott, Felton; A. A. Weymouth, Soquel; and C. B. Lewis, Watsonville, is actively interesting itself, even though burdened with responsibility for the construction of the bonded system, Mr. Harvey especially having worked tirelessly for road betterment throughout the county.

In addition to the Board of Supervisors and the County Highway Commission, which latter body is serving without pay, although allowed by law a per diem fee, the Santa Cruz County Good Roads Association has worked long and hard for road betterment. The officers of this association are:

View from Boulder Creek road looking down upon the tracks of the Southern Pacific Railway.

Inspiration Point on the Santa Cruz Lateral of the State Highway. To be paved with concrete.

Fred R. Howe, Santa Cruz, president; W. R. Radcliff, Watsonville; Mrs. David Kaplansky, Happy Valley; Isaiah Hartman, Boulder Creek; Mrs. F. A. Dixon, Santa Cruz, vice-presidents; A. A. Morey, Santa Cruz, secretary; and O. D. Stoesser, Watsonville, treasurer.

An advisory committee is also active, consisting of the above-named men and women, together with Frank Reanier, Capitola; W. T. Jeter, Santa Cruz; F. E. Selleck, Corralitos; W. S. Rodgers, Boulder Creek; C. H. Murphy, and Mrs. E. L. Clark, Watsonville.

To conclude this article without touching upon the campaign which swept the bond issue to success on June 10, 1919, would hardly be appropriate, for such opposition was advanced thereto by one of the leading daily papers of the county as to bring about a bitter fight.

In active charge of the campaign for better roads was Fred R. Howe, chairman of the Good Roads Association, the campaign manager for the Santa Cruz district being B. F. Brisac, Jr., while E. H. Haack was chairman of the Watsonville district, where, with John E. Gardner, W. R. Radcliff, and O. D. Stoesser, he conducted an admirably planned campaign. Helping out also in the movement for better roads was the Santa Cruz County Farm Bureau, that splendid constructive organization established by government, state, and county funds, Farm Adviser H. L. Washburn holding meetings in every section of the county under encouragement of O. W. Fletter, his president.

Newspapers throughout the county, with the exception noted above, did splendid work, the Santa Cruz *Sentinel*, with Duncan McPherson; the Santa Cruz *News*, with H. R. Judah, Jr., and E. J. Devlin; and the Watsonville *Register*, with J. B. Atkinson, giving strong editorial support. In laying out the highway system the engineer in charge was R. K. West, who finished up the preliminary work and then went to France as Captain in the United States army, his place being taken by Lloyd Bowman, now in charge, who is engaging himself in building the 39.10 miles of highway provided for under the bond issue.

CHAPTER XL

SOLANO COUNTY

SOLANO COUNTY, situated midway between San Francisco and Sacramento, is one of the leading fruit-growing counties in the state, this industry having been started more than sixty years ago by pioneers who preferred to engage themselves peacefully in agriculture rather than in that feverish quest for gold which promised so much and gave so little of reward.

Four distinct fruit sections exist in the county, made notable by the volume of production which takes place and by the practical certainty of never-failing crops, these being the Vaca Valley and Pleasants Valley, where plums, peaches, and apricots ripen each year earlier than in almost any other section of the state; Suisun Valley, noted for its Bartlett pears and cherries; and Green Valley, where early cherries and wine grapes have brought in unfailing returns.

For years the various boards of supervisors charged with the administration of county affairs did the best they could to meet the road problems presented, until finally, realizing that some outside agency could probably afford them a solution of the trying situation which confronted them, they called upon the United States Bureau of Public Roads to detail an engineer to assist and advise them in developing a county-wide system of paved highways, this application being made in December, 1917, the Board of Supervisors at that time being made up of D. M. Fleming, chairman, of Vallejo; H. J. Widenmann, Vallejo; W. B. Connelly, Suisun; Charles E. Claussen, Dixon; and Thomas McCormack, Rio Vista.

Owing to the fact that the United States Bureau of Public

In the foothills orchard and vineyard section where much road tonnage originates.

The entrance into the Vaca Valley on the State Highway.

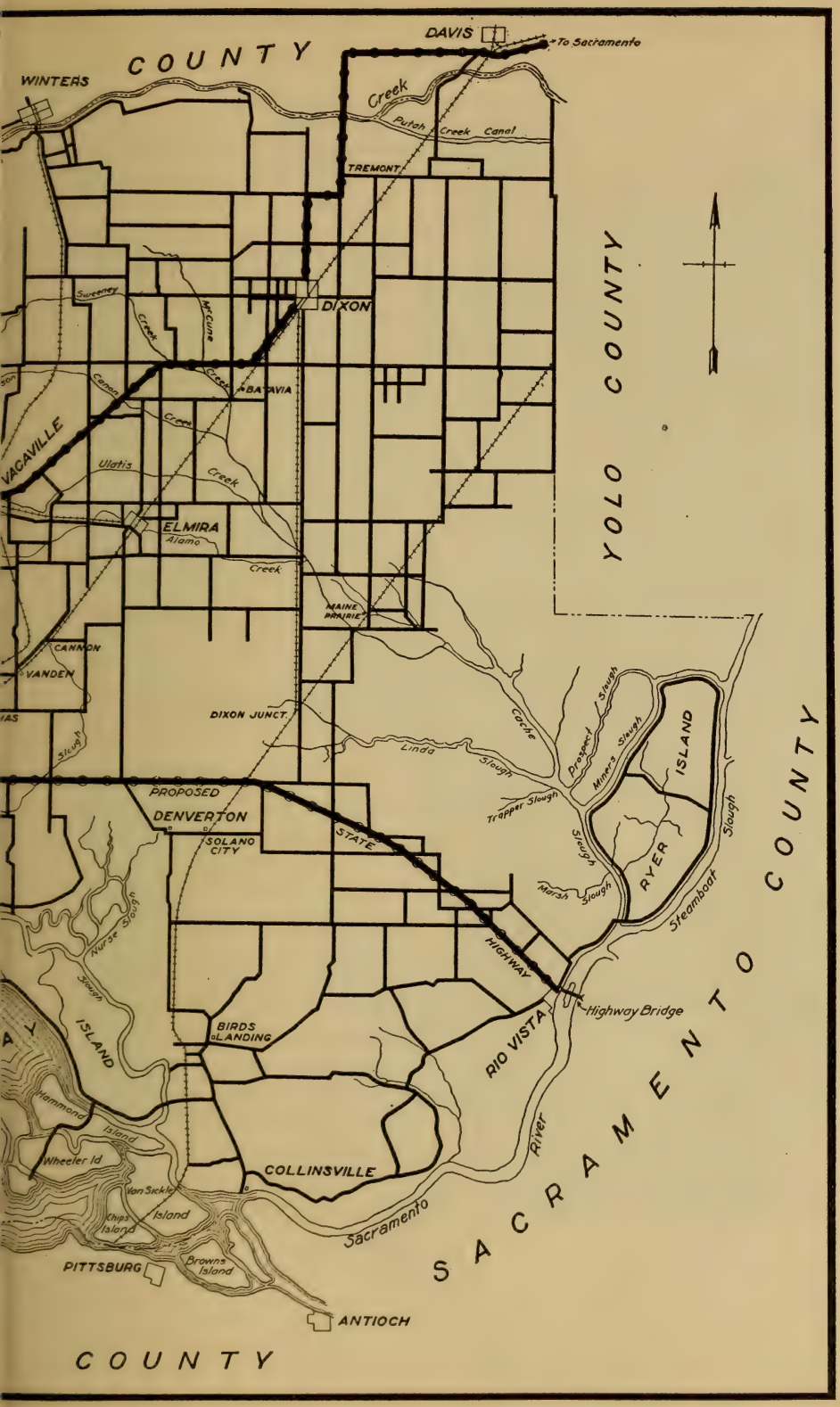
Roads was hampered by war conditions no response was made to the application until October, 1918, when one of the engineers of the Bureau of Public Roads made an investigation and report in which he touches upon county soil production as follows: "Solano County is an important agricultural and orchard section of the state and has attained a high state of development. It has a land area of about 544,000 acres, of which 460,000 are in a state of cultivation for hay, grain, and other field crops, about 15,000 acres being in vineyards and orchards, the balance of the county's acreage being hilly and mountainous or in the undeveloped flooded lands.

"The agricultural products of 1918 consisted of 110,000 tons of barley and 60,000 tons of wheat, while other field and forage crops were under cultivation as follows: Oats, 10,000 acres; hay 75,000 acres; beans, 10,000 acres; alfalfa, 50,000 acres; tomatoes, 2500 acres; and asparagus, 2000 acres. Of orchard land about 5000 acres are in vineyards, while bearing deciduous fruit trees were reported at 1,103,500."

After thus reviewing the agricultural production of this prolific county, the engineer continues: "In the developed section of the county smooth roads are essential for the economic and quick handling of produce that is highly perishable. This applies more particularly to the fruit-raising sections, although in other parts of the county good roads will distinctly help in development."

Upon reference to the accompanying map it will be seen that a fair mileage of paved highways has already been built with other roads proposed, one of the most important of these being that which connects the City of Vallejo with the State Highway at Cordelia by way of American Canyon, supplying direct road access between Vallejo, the largest city in the county, where the great Mare Island Navy Yard of the Government is situated, and Fairfield, the county seat; the highway connection between the places named at the present time being indirect and circuitous, imposing no little hardship upon the people of Vallejo having business at the county seat. By the construction of this road, which passes through

Solano County is steadily engaged in developing a paved highway system by use of curren funds or under one or another of the various road district improvement acts.



The proposed State Highway between Rio Vista and Fairfield-Suisun is one of the most important of California's Cross State Highways.

a corner of Napa County, the round-about trip by way of Napa Junction or Benicia will be cut in time and distance from one-third to one-half.

Another important road is that from Rio Vista to Suisun, which would supply not only a main traffic line between the two towns but also would tend to develop an agricultural section of the county that is badly in need of roads. At the eastern end of this road at Rio Vista, a highway bridge of the bascule type has been built at a cost of $200,000, shared jointly by Solano and Sacramento counties, which forms a short and direct cross-country outlet for travel between lower Sacramento and upper San Joaquin Valley points and the northern reaches of the California coast.

To the eastern end of this bridge a paved highway of the Sacramento County system is now being built which will, when completed, connect with the roads of San Joaquin County and thus supply another tie-up between the coast and valley routes of the State Highway. So important is this road deemed that it has been given place in the $40,000,000 bond issue provided for by the Legislature of 1919, and is to be built by the State, thus relieving Solano County of one of its most trying road problems.

In passing, it may be said that the inclusion of this road in the proposed State Highway bond issue crowns with success a long-continued effort on the part of the Solano County Board of Supervisors to have it made a state road, Supervisor Thomas McCormack of Rio Vista having been especially active in bringing the matter to a successful issue. In the initiation of the plan to have this road made a part of the state's road system, Mr. Henry Widenmann of Vallejo, a member of the Solano County Board of Supervisors as well as a member of the California Highway Commission, took an active part up to the time of his death, which resulted from an accidental gun wound received while hunting, his passing being a loss not only to Solano County but also to the state.

From Vacaville, in the beautiful and productive Vaca Valley, to the Yolo County town of Winters at the Solano County line another road of great importance is proposed

Bascule bridge over Sacramento River at Rio Vista. This bridge supplies a cross-state connection by way of Rio Vista and Suisun.

Highway in Green Valley built under Road District Improvement plan.

connecting up with an extension planned by Yolo County and running from Winters by way of Madison to Blacks and forming an alternative route to the Sacramento Valley trunk line of the State Highway, which is not only much shorter but also is far more interesting from a scenic standpoint.

Without attempting to enter into further details relative to the road system which is proposed for Solano County, it may be said that the road distribution charted upon the accompanying map is based in practical entirety upon commercial need, crop production of varied kinds being so great in this county and resulting in so much wealth as to make any consideration of purely touring roads a matter of no importance.

In so far as actual road building in Solano County is concerned comparatively little has been done, owing to the lack of funds, but here and there throughout the county paved roads have been put in a few miles at a time, the State Highway type of concrete construction being adopted as best fitted in the development of a county-wide plan. By direct tax and under one or another of the various road district plans approximately twenty-five miles of paved highway, mainly concrete, has been put in tributary to Vallejo, Benicia, Dixon, Vacaville, Suisun and Fairfield, the amount of mileage already built, while comparatively small being an illustration of what sheer persistency can accomplish and it is certain that the present Board of Supervisors made up of W. B. Connelly, C. E. Claussen, Thomas McCormack, D. M. Fleming and John R. Thornton, is going to keep the good work going along.

CHAPTER XLI

SONOMA COUNTY

In contemplating the road improvement plans of this beautiful county, which are based on a bond issue for $1,640,000 passed on May 24, 1919, it may not be inapt to quote from the report of Senior Highway Engineer W. H. Lynch of the United States Bureau of Public Roads, who was called in by the Board of Supervisors to advise them as to the best method of developing a modern highway system.

"The road problem of the county," Mr. Lynch states, "can best be approached by dividing the county into two sections. The greater part of the county, where better roads are needed, is highly developed agriculturally and large and extremely valuable crops are produced each year. The nature of a good portion of the products (eggs, fruit, and vegetables) requires a smooth, hard-surfaced road to market to prevent undue loss from crushing and also provide cheap transportation. This section of the county should be provided with adequate roads first in any extensive program of road building, and the wearing surface should be of a high type, as traffic on the main highways is sufficient in volume to warrant the best construction.

"The part of the county along the Russian River of which Guerneville is the center," he continues, "is devoted to tourist travel and recreation resorts. It is considered a playground for San Francisco, and while not as important from a road development standpoint as the agricultural section, at the same time the county cannot afford to neglect the traffic which is attracted there and brings into the county a large revenue."

In discussing the type of road suitable for the traffic con-

Highway bridge over Russian River at Guerneville built by Board of Supervisors of Sonoma County.

On the Sonoma County Coast Road.

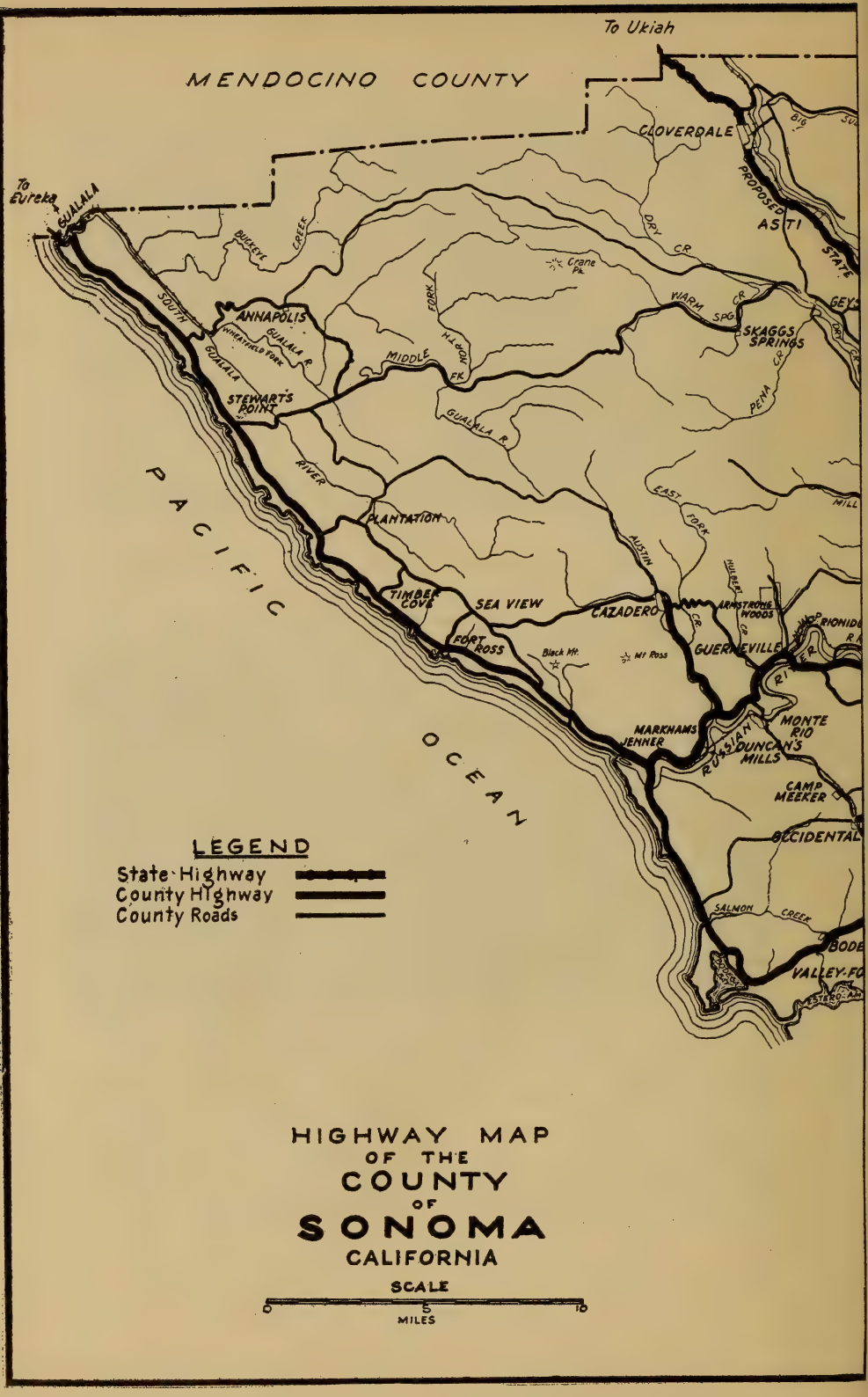
For miles along the coast Sonoma County is improving this highway.

ditions found, Mr. Lynch suggests a "width of roadway of at least twenty-four feet, with a surface of concrete where the subgrade is of material that can be brought to a firm unyielding condition, the concrete to be of one-two-four mix, five inches thick, sixteen feet wide."

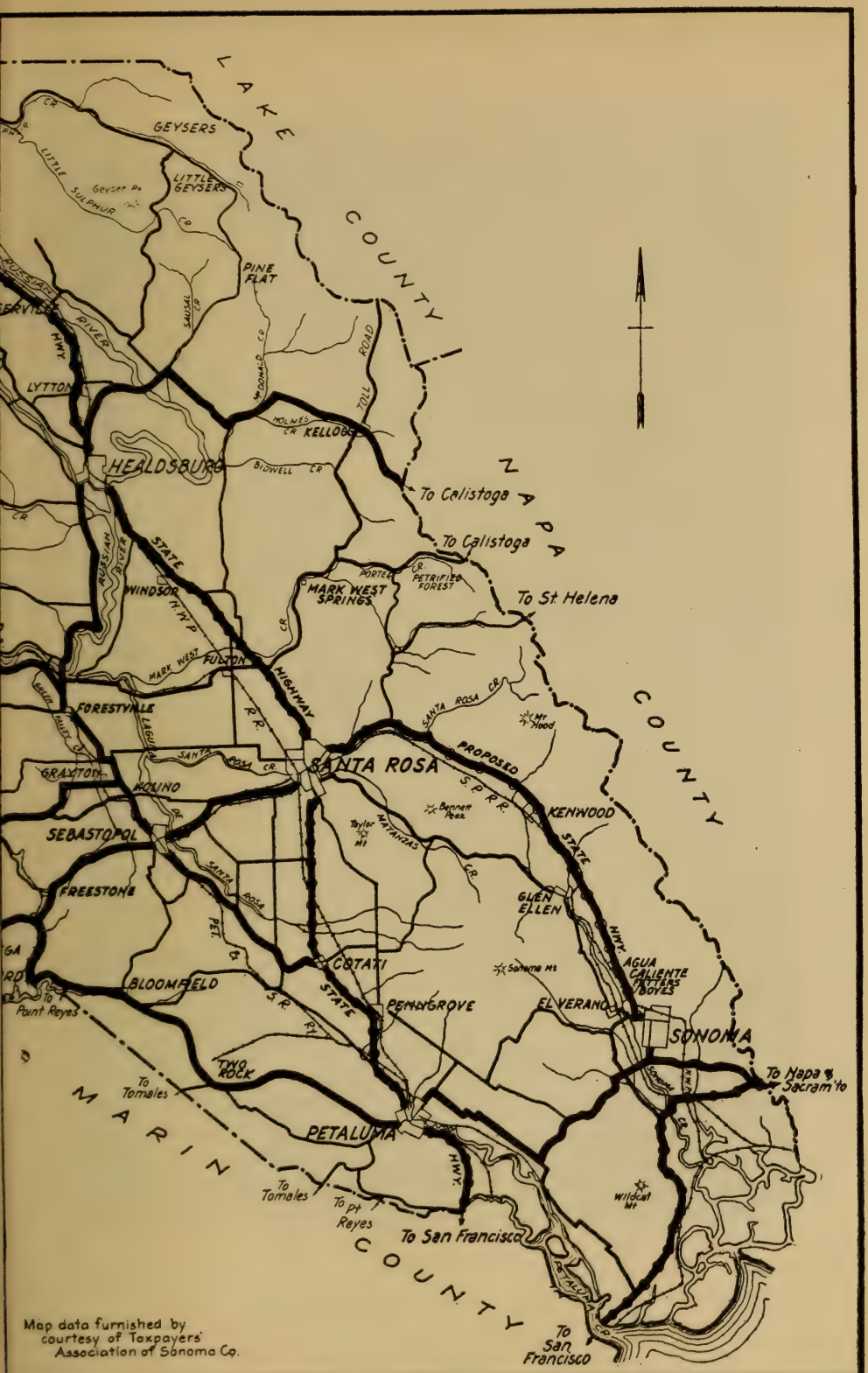
It will be noted that Mr. Lynch recommends a minimum thickness of concrete of five inches, and this recommendation, made early in 1918, marks the development of a movement for thicker concrete roads in California and constitutes the first radical departure by government recommendation from the established four-inch-thick standard of the State Highway. Following this recommendation practically every county in California now contemplating the building of concrete highways is basing its plans on pavement at least five inches thick, Merced County, which voted bonds in November, 1918, being the first to start construction of a county-wide system of five-inch concrete highways, although Contra Costa County, building by direct tax, has been putting in five-inch-thick concrete roads for several years.

Sentiment for better roads in Sonoma County dates back to 1914, when a county bond issue was unsuccessfully attempted, since which time the Board of Supervisors, made up of O. N. Charles, Cazadero, chairman; J. H. Weise, Glen Ellen; H. F. Doss, Petaluma; William Cunningham, Windsor; and A. D. Goddard, Healdsburg, has built thirty-five miles of asphaltic macadam road out of annual county funds at a cost of something like $3,500 a mile, not thinking for one moment that these roads were permanent but striving to do the best they could with limited funds.

In so far as type of road is concerned it may be said that the adopted plan follows closely the recommendation of the government engineer, concrete road being specified for those thickly settled sections around Petaluma, Santa Rosa, and Sebastopol where a heavy traffic exists. This traffic around Petaluma consists largely of eggs being hauled to market, Petaluma being the egg-producing center of the Pacific Coast, although fruits of various kinds, berries, and other soil products are produced in considerable quantity.



The highway shown along the coast is to be surfaced with local materials under the Sonoma County bonding plan. This stretch of road, with Marin and Mendocino counties coast road development, will form a link in a San Francisco to Oregon coast road. Highways shown are under construction in 1919.



The main trunk line of the State Highway is to be completed or under contract shortly after the end of 1919. The stretch from Sonoma to Santa Rosa, paved in part by the county, forms part of the 1919 State Highway bond issue plan as does the paving of link from Napa reaching Petaluma Creek popularly known as the Black Point Cut-off.

Santa Rosa being the county seat has need for a tributary road system for that reason alone, although the agricultural production in its vicinity is of great volume, this section in the past having been the center of the dry wine industry where millions of tons of grapes were crushed each year. In addition to wine production the orchards of Sonoma County produce a high-grade quality of prune, while apples of various kinds are grown in profusion and of a quality which has gained them widespread reputation, the seat of this particular phase of production being Sebastopol, a few miles to the westward of Santa Rosa.

From Sebastopol, under the county highway system being built in 1919, a concrete road reaches into the Russian River section of the county at Guerneville, this place being the center of that area which Mr. Lynch refers to as a playground for San Francisco. Here the hillsides are dotted with summer homes of city folk, built in the shadows of redwoods close to an ever-flowing stream that affords endless opportunity for boating and bathing, and near here is the famous grove where the members of San Francisco's Bohemian Club come for a plunge into the age-old forest when weary of city life.

Close to Guerneville also is another grove of huge redwoods, owned by the county and known as Armstrong Park. Plans for the development of this park into a summer camping ground for the public are already under way and need only road development to be whipped into some concrete form.

From a standpoint of touring interest Sonoma County is singularly fortunate, having at Sonoma the farthest north of the Missions built by the Padres. At Sonoma also the Bear Flag was raised in the plaza, which still is flanked by buildings of the old adobe Spanish type. Near Geyserville steaming geysers serve to attract a volume of traffic each year, while along the coast a myriad of outing places are to be found, the coast section being supplied with a road under the adopted plan which, while not intended to be paved will supply a wide, well-graded highway of easy ascents and

Sixty-four thousand eight hundred eggs on one truck. An impressive argument in favor of good roads.

On the Russian River.

Near Healdsburg.

West of Petaluma.

Between Santa Rosa and Sonoma.

declines where scarcely a road worth calling such today exists.

In securing the road development which is now in full swing in Sonoma County many men have worked untiringly, the organization fathering the movement being the Sonoma County Taxpayers' Association, of which Frank R. Doyle is president and John L. Peters secretary, the board of directors being made up of W. M. Rutherford, John R. Denman, W. L. Sales, B. B. Henshaw, all of Petaluma; C. A. LeBaron, Valley Ford; A. Hendron, Occidental; Charles Humbert, Cloverdale; George C. Alexander, Healdsburg; F. A. Abshire, Geyserville; J. B. Sheppard, Windsor; J. C. Bennett, Sebastopol; Robert P. Hiel, Eldridge; E. C. Rand and Frank Keith, Santa Rosa.

Actual road construction is to be under the direct charge of the Board of Supervisors, the engineer employed being Lloyd Aldrich, who finished up the famous Stanislaus County system, and to aid them in the development of a creditable system the Board of Supervisors named an advisory committee. This committee consists of L. V. Korbel, Petaluma; E. D. Seaton, S. W. Baker, and C. O. Dunbar, Santa Rosa; James Sewell, Healdsburg; Fred G. Duhring, Sonoma; W. N. Hotle, Sebastopol; Ralph Belden, Guerneville; Thomas Maclay, Petaluma; and C. L. Sedgley, Cloverdale, with other men selected from the board of directors of the Taxpayers' League, their duties being purely of an advisory nature and their desires being to lighten the burden which rests upon the Board of Supervisors of getting a dollar's worth of value for every dollar spent, the road mileage involved in the bond issue being 182, while of concrete highways five inches thick and sixteen feet wide there are 58.4 miles, 35 miles of oil macadam being already built.

In addition to the road problems of the county the construction of many bridges is part of the county program, the cost of such bridge construction to be provided for by the levy of additional taxes and the general plan being to make Sonoma County, long a byword and a reproach, one of the banner good roads counties of the state.

CHAPTER XLII

STANISLAUS COUNTY

THE HIGHWAY system of this county, popularly regarded as one of the best in the state, consists of one hundred thirty-one miles of concrete roads in addition to the State Highway of approximately fifty miles. In the main these county highways are sixteen feet wide, twelve-foot roadways being laid down in some of the more distant sections of the county where traffic, heavy in the single unit, is not sufficient in volume to warrant more expensive roads.

Around centers of population where the road tonnage is heavy the wider pavements are supplied, the minimum thickness being four inches, patterning after the State Highway, and the plan pursued in constructing these roads involves leaving them unsurfaced on the theory maintained by County Surveyor Annear, the man who built them, that the unsurfaced concrete road is the ideal pavement until such a time as the need for a carpet treatment of some kind shall become apparent, if at all.

The roads of Stanislaus County are exceptionally smooth and easy riding and remarkably free from transverse or longitudinal cracks even where the soil is of adobe, expansion joints being set in at intervals of thirty feet to take up all shift in mass resultant from a variation in the temperature which reaches from twenty-eight to one hundred ten degrees in the extreme, although the mean temperature of the county, according to government readings is from forty-eight to eighty-one degrees.

The most interesting phase of the Stanislaus County road system deals, perhaps, with the method employed in financing the bond issue which made it possible, and so

On a Stanislaus County highway. Many of the ranchers have paid for an additional width of highway in front of their homes.

Major E. H. Annear, the builder of Stanislaus County roads, who gave his life to his country.

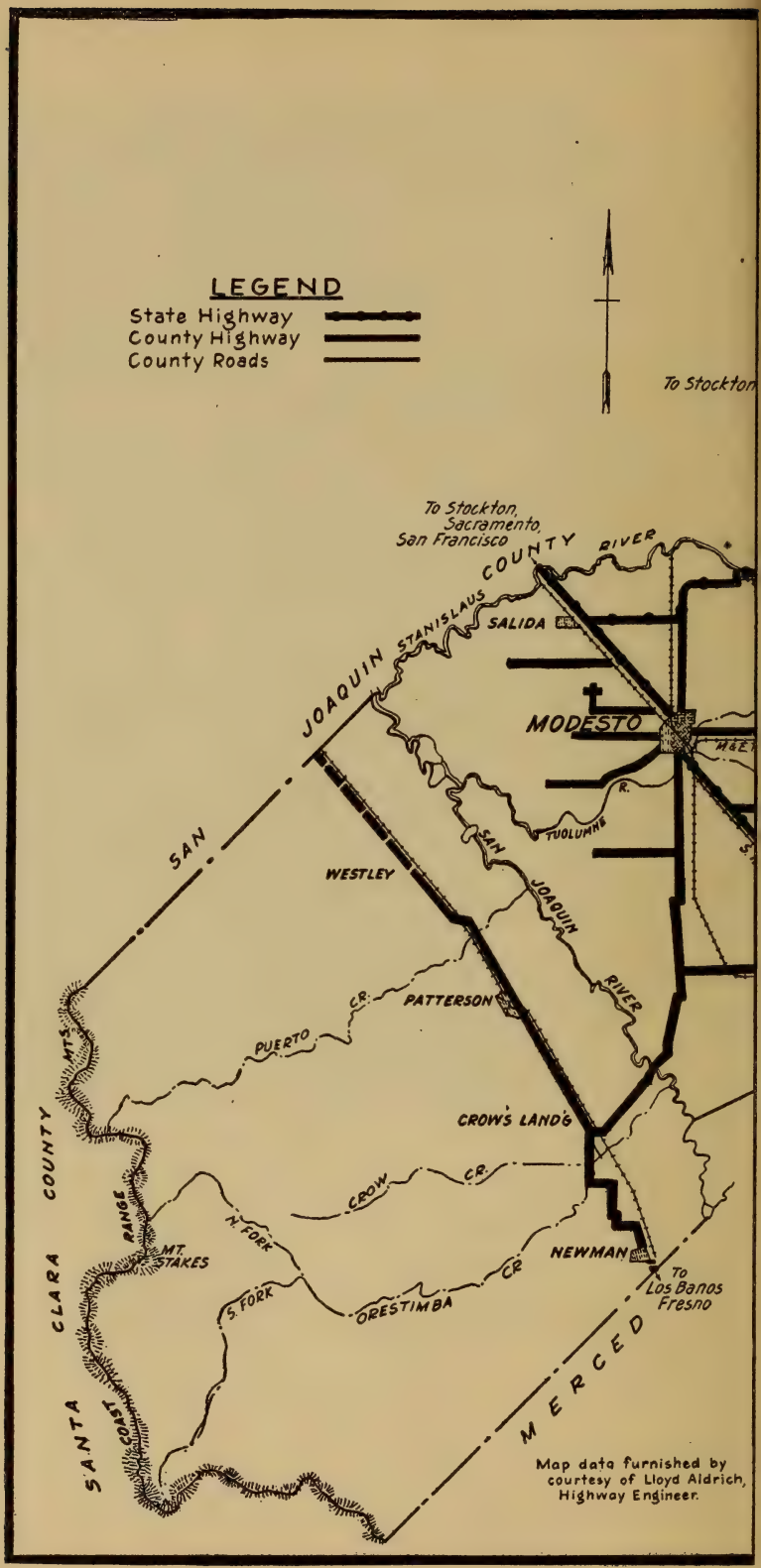
simple was this plan in its conception, and so practical has it proven in its application, that it may well be treated at some length and recommended to other counties of like assessed valuation and similar road mileage needs, as worth while considering carefully.

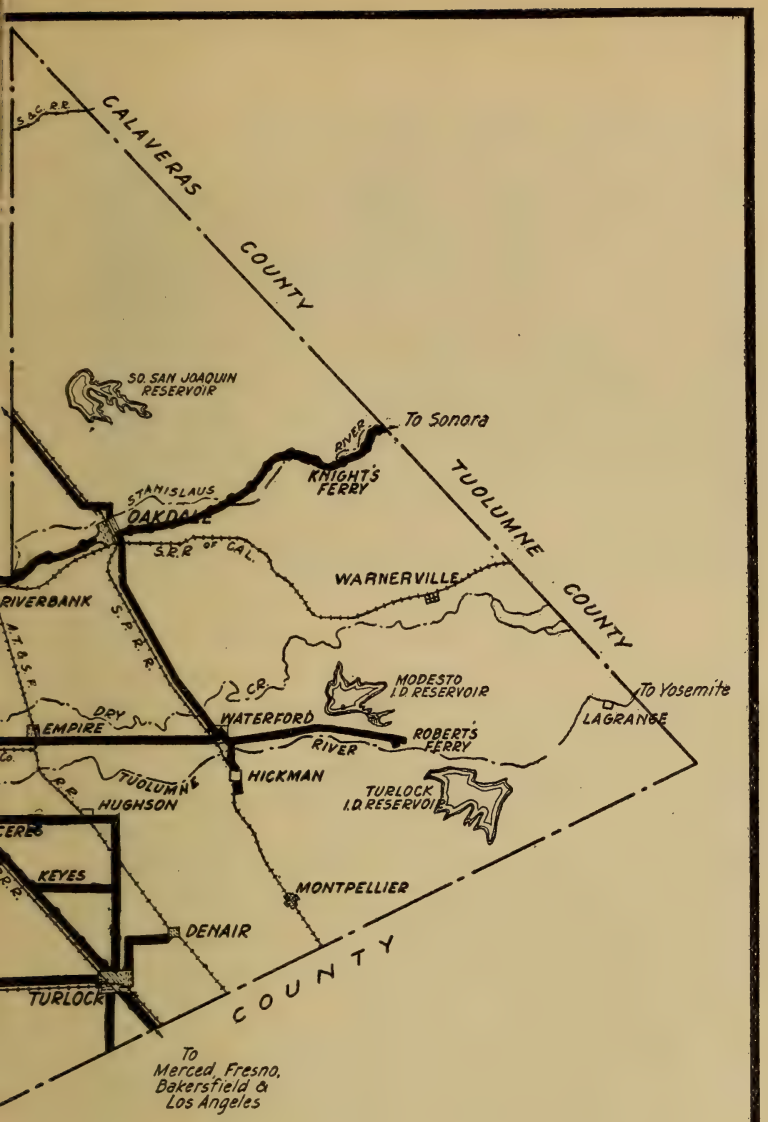
To one individual, Edgar H. Annear, for many years county surveyor, this plan is practically entirely due, and the roads of Stanislaus County are a monument to his memory, a monument truly in this case, for, entering the service of his country as a captain, he was sent to France, and there, after a period of intensive training, given a commission as major and detailed back to the United States to recruit a battalion of sappers and combatant troops but died of pneumonia in a military hospital in New Jersey shortly after reaching his native land, leaving behind him a record as a clean, upstanding man of fine ideals and more than ordinary professional accomplishments.

The Stanislaus County road plan, intended in the main to develop a method of getting a road system with little, if any, raise in the county tax rate, was made necessary by the fact that the development of comprehensive irrigation systems had already imposed a charge upon property holders which, in many instances, they did not desire to increase, and involved an application of the yearly road funds provided for by law in taking care of the annual charges incident to a bond issue. It came into being after County Surveyor Annear had made an extensive study of road traffic as compared with the yearly application of road funds.

This study developed the fact that approximately one hundred and twenty-five miles of county road bore the mass of travel and required for repair and maintenance about three-quarters of the annual county funds, this seventy-five per cent amounting in 1916 to $72,171.27, the total road fund for this year being $96,228.38 derived from a tax levy of forty cents upon the one hundred dollars of assessed valuation on "outside" property, that is, property outside of the limit of incorporated cities, property inside of these municipalities being exempt by law from any road tax.

The Stanislaus county highway system is entirely completed with the exception of that stretch from Westley to the San Joaquin County line. This highway connects with the Merced County system near Newman forming, with the Fresno County system, a west side line from Fresno and lower San Joaquin Valley points to San Francisco.





HIGHWAY MAP
OF THE
COUNTY
OF
STANISLAUS
CALIFORNIA

SCALE
0 6 12
MILES

The State Highway through Stanislaus County is entirely completed with the exception of a portion between Oakdale and the Tuolumne County line which is under contract in the latter part of 1919.

When he had developed these facts Mr. Annear went before the Board of Supervisors, that body of men charged with responsibility for county affairs, and explained to them that in his opinion some very practical plan for a permanent road system might be worked out.

The Stanislaus County Board of Supervisors of 1919, made up of Vaughn D. Whitmore of Ceres, chairman; J. H. Clarke of Oakdale; C. R. Little and E. A. Johnson of Modesto; and Frank R. Raines of Westley, is the same in identity as the body before which Mr. Annear appeared with his fledgling road plan and it is to their credit that they at once got behind him, appointed an advisory committee made up of Horace Crane, a retired banker of Turlock; R. W. Hobart, president First National Bank of Riverbank; Homer Tucker, rancher from the west side of the county; George Bentley, real estate man of Oakdale; and Henry Garrison, a rancher living near Modesto, and encouraged him to develop and submit a detailed report and recommendation for a good roads bonding plan.

This plan, when finally presented, recommended a concrete highway system involving 126.14 miles coupled with the explanation that the cost thereof would be $1,482,000. Four and one-half per cent, thirty-two-year, serial bonds were recommended, the declaration being made that the average annual expense involved for payment of interest and retirement of bonds would be $89,776.12. As opposed to this amount, Mr. Annear and the advisory board declared, was the sum of $72,171.27 already being spent on the mileage involved which left a deficit of only $17,594.85 to be raised each year in order to get the roads without increase in tax on "outside" property. To meet this deficit under a bonding plan the taxes contributed by the different incorporated cities of the county, which normally paid no road tax although benefiting from the county's roads, would be practically sufficient, it was declared, with only a slight increase of tax rate inside of municipalities.

After a thorough review of the facts finally presented, the Board of Supervisors approved them and took the formal

Concrete runway from county highway to a ranch garage.

Dry Creek bridge on Stanislaus County highway system.

Adobe fill on Modesto-Crows Landing road.

Roberts Ferry Bridge.

steps necessary to place the matter before the people at the election to be held on November 9, 1916, and here the matter rested, and seemed to drag a bit.

At this point, Mr. Frank A. Cressey, Jr., of Modesto, a man of personal accomplishments and independent means, stepped in believing that the plan proposed was a much-needed public betterment and inspired to no small degree by his admiration of and friendship for Mr. Annear. A campaign organization was formed under the name of "The Stanislaus County Good Roads Association," Mr. Cressey being elected president, and an active campaign was begun with the result that the measure carried overwhelmingly, the two daily papers of the county, the *News* and the *Herald*, edited by Messrs. E. H. Sherman and T. A. Hocking, respectively, giving a practical and effective editorial support.

Bonds were promptly issued and sold, a premium of $96,000 being obtained, and Mr. Annear proceeded at once to build roads, progress being hampered, as time passed, by increased prices of labor and material due to war conditions until at length it became necessary to supply approximately $30,000 of county funds to complete the job, the final work being in charge of Mr. Lloyd Aldrich, who had served with Mr. Annear and knew in detail the methods of his work.

In addition to the bonded system of 126.14 miles, what is known as the McHenry road, running north from Modesto, four miles in length, supplying a direct connection with the Sonora lateral of the State Highway, and a one-mile stretch of concrete road north of Newman were built, it might be said as object-lesson roads in the period when the bonded system was under plan, giving a total county mileage of slightly more than one hundred thirty-one miles, which the Board of Supervisors plans upon extending to meet the needs and wishes of the people, the man in charge of road work in 1919 being the county surveyor, J. H. Hoskins, who is charged with responsibility for maintaining the roads Mr. Annear built.

CHAPTER XLIII

SUTTER COUNTY

On February 3, 1919, the Sutter County Board of Supervisors, made up of George Trevathan, Frank Graves, Sam Gray, A. E. Schellenger, and E. J. White, decided that the time was ripe for presenting to the people of the county a definite plan for road improvement, and thereupon applied to the United States Bureau of Public Roads to detail an engineer to look over the situation and make such recommendations as might seem best.

In taking this action the Board of Supervisors had the enthusiastic backing of the Sutter County Farm Bureau, which organization had measured county sentiment and found it overwhelmingly in favor of road improvement. The officers of the Farm Bureau at the time named were R. L. Morehead, president; C. E. Moore, vice-president; L. A. Walton, E. S. Wadsworth, W. B. Clark, and J. R. Catlett, directors at large; the general directorate being composed of E. Thayer, C. L. Mosely, C. E. Reische, J. D. Rodolf, G. C. Galbraith, Dr. E. S. Moulton, Albert Graves, and Robert Shields. These men, all hard-headed business men, had watched the expenditures of county road funds for some time and, in conjunction with the Board of Supervisors, had come to the conclusion that Sutter County, in order to progress as it should, must adopt modern road-building ideas. So a Government engineer was called in; and what he thought about the general situation is made plain by the following excerpts from his report:

"Sutter County," he writes, "is an important agricultural and orchard section of California. The orchard sections are, more particularly, highly developed and are still susceptible

Drawbridge across Feather River at Nicolaus built by direct tax under direction of the Board of Supervisors.

Between Live Oak and Pennington. This highway is to be paved under bond issue.

of considerable expansion. The county is composed of three distinct areas, each having a different class of development. The Sutter Buttes, a range of rugged mountains covering an area of about 50,000 acres, is chiefly grazing land and, with the exception of the lower slopes which are cultivated, other development is absent.

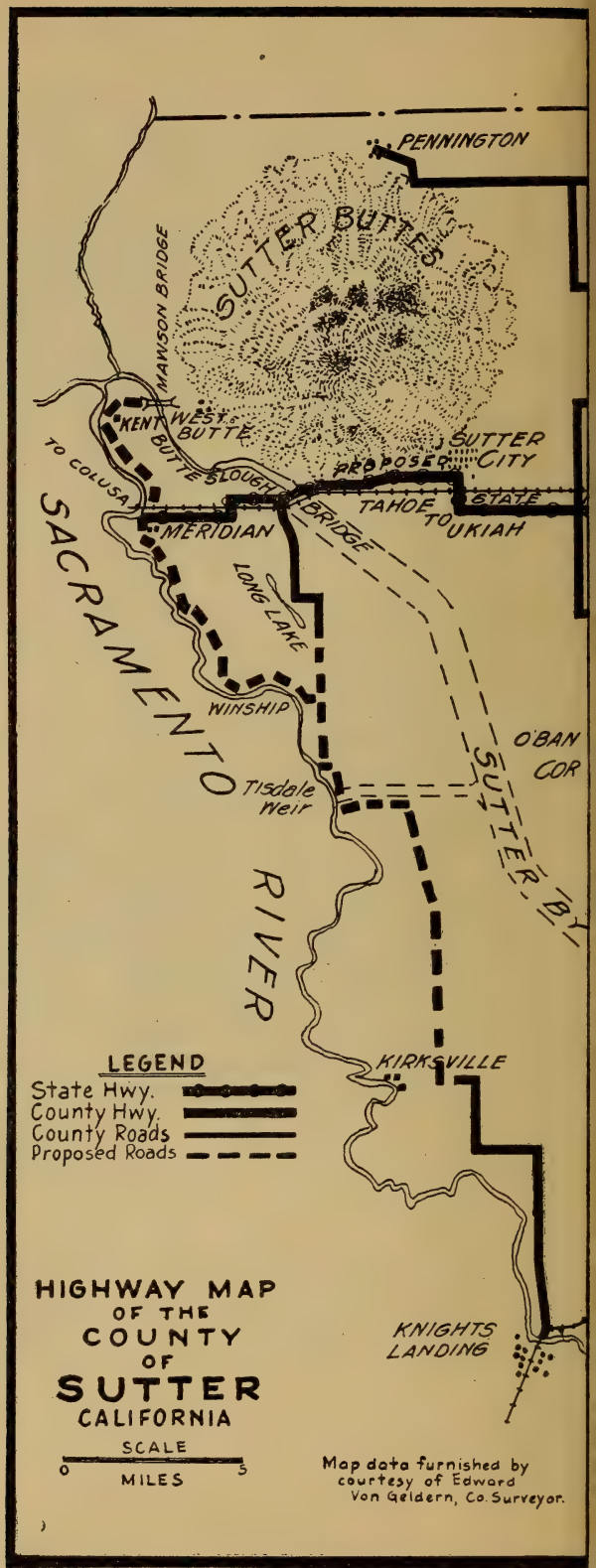
"The second area of development follows generally the ridges of deep soil parallel to the river banks and elevated either naturally above the flood line or reclaimed by the construction of levees. A third large area of the county, known as the Sutter Basin, between the levee of the Sacramento River and the proposed Sutter by-pass, is as yet undeveloped for extensive cultivation. A similar basin, known as the American Basin, lies east of the Feather and Sacramento rivers in the southerly part of the county. This section has been reclaimed and the development is progressing rapidly. With the exception of the Sutter Basin, practically the entire area of the county is already susceptible of cultivation. Of orchards there are 13,768 acres and of vineyards 8,610 acres, producing about 68,000 tons of fruit, a great part of which is marketed fresh and requires surfaced roads for economical and safe hauling to shipping points.

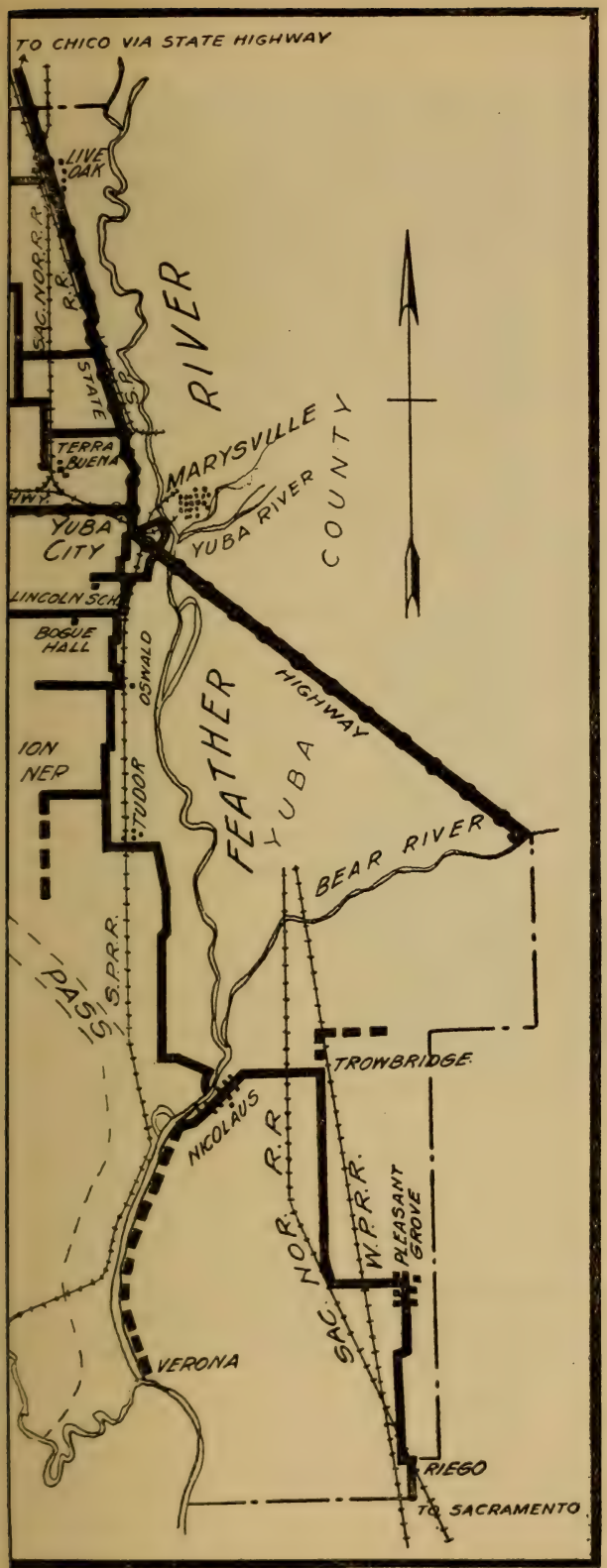
"Under field crops there are annually about 150,000 acres, chiefly in barley, wheat, oats, rice, and beans, producing from 200,000 to 300,000 tons annually, all of which has to be moved over the highways longer or shorter distances to either rail or water transportation. Alfalfa is grown on nearly 8,000 acres, producing an aggregate of about 60,000 tons.

"With the exception of Yuba City, the county seat, there are no other municipalities in the county, and the population and farm residences are fairly distributed along existing highways, except in the areas subject to overflow, the orchard section in general being in small holdings occupied by the owners.

"The road traffic, while light during many months, is exceedingly heavy during the harvest season. There are a number of smaller towns which are to some extent the trading centers of surrounding areas. The principal of these are Live

The roads shown in broken lines are those which are to be built by direct tax under a pledge made when bonds were voted. To get more road money it is planned to raise the assessed value of the County so another bond issue can be voted.





The most highly developed area of Sutter County lies along the Feather River, hence most of the road plan voted under the bond issue is in this section of the county.

From Riego south is only a few miles to a Sacramento County highway, while a proposed extension south from Verona, on the Sacramento river will supply another route to Sacramento, part of which, in Sacramento County, has already been paved by the Natomas Company of California.

Oak, Meridian, Nicolaus, and Sutter City. There is only one permanently constructed road in the county and that is the State Highway, built as a concrete road, which extends from Yuba City northerly and runs parallel to the Southern Pacific Railroad."

The above report may properly be regarded as a fair and conservative statement of existing facts, and was followed by a detailed recommendation for a bonding plan which, it may be said, the good-roads enthusiasts of Sutter County accepted gladly and used in a more comprehensive scheme of road improvement than the conservatism of the Government engineer permitted him to recommend, he confining himself to the bonding capacity of the county as he found it and limiting his recommendations thereto.

The Farm Bureau, however, in conjunction with the Board of Supervisors, proceeded first to raise the county assessment roll about twenty per cent, gaining a greater bonding capacity thereby; and then, in addition to planning for certain roads under a bond issue, decided that they would build additional needed roads by direct tax, resolved that when they undertook to improve their county highways they would do a good job or none at all. The type of road to be put in is concrete, there being 87.50 miles planned under the bond issue and by direct tax.

Reference to the accompanying map will show the bonded roads that are planned as well as those provided for under direct tax, the road problems of the county being somewhat lightened by the fact that the State Highway bond issue for $40,000,000 voted on July 1, 1919, provided for a cross-county road between Yuba City and Meridian, taking care of one of the heaviest-traveled roads in the county and throwing the burden thereof upon the state.

It will be seen that the main road distribution under the county bond issue was in the eastern part of the county, this section being highly developed and the major part of the county's road burden originating therein. Over this section, its production of fruit, and the development of its orchards one not a Government engineer might be induced to enthuse,

A Sutter County ranch home on the State Highway. Pavement widened at cost of rancher to property line.

Much of Sutter County's road tonnage comes from its bean fields. Sutter Buttes in background.

for upon all sides are orchards producing peaches and prunes in such crop abundance as to make the net returns per acre almost sound like a fairy tale.

It may be said of Sutter County without hurting anybody's feelings, now that the people of the county have voted a good-roads bond issue by more than twenty to one at a campaign expense of only about $150, that prior to 1919 it was one of the most backward counties in the state in so far as road development was concerned. There wasn't a single county road that might by any stretch of the imagination be regarded as of modern type while on all sides were vacant acreages that save for the lack of road improvement would have been turned into prolific orchards of different kinds. As a matter of fact, this county has been a sort of Cinderella, inconspicuous on account of ragged roads, while of sterling worth, with land prices so low in comparison with other sections as to be almost ridiculous.

That a campaign was needed to carry the road plan through, any good-roads enthusiast well knows; and this campaign, conducted by the Farm Bureau, County Farm Adviser C. E. Sullivan being actively in charge, was crowned with success on August 28, when $810,000 of bonds were voted and Sutter County for once and all emerged from mud, only 53 votes in the entire county being recorded as opposed to the bonding plan.

In the work of building the road system planned, which in the main provides for asphaltic type of roads, County Surveyor Edward von Geldern is to be the man in charge, under the Board of Supervisors, while to assist them the board has named an advisory committee made up of R. L. Morehead, Loyd Wilbur, A. T. Spencer, J. M. Hampton, and Sam McKeehan, all of the men named being resolved that their efforts will not end until Sutter County compares with the other good-roads counties of the state.

CHAPTER XLIV

TULARE COUNTY

This county, with an area of 4935 square miles, is one of the larger counties of California, and hence its road problems for years have been of sufficient size to afford the different Boards of Supervisors much food for thought. In topography the county is about evenly divided, practically one-half being on the western slope of the Sierras and the foothills leading thereto, the remainder being valley land of an alluvial character which has been developed until a tremendous crop tonnage of varied kind today exists and aside from emphasizing the need of good roads, proves that the men who planned and developed the campaign for road improvement which culminated in March, 1917, in the passing of a bond issue for $2,200,000.00, knew pretty well what they were about.

These men were J. H. Newman, F. M. Pfrimmer, J. N. Birkhead, J. N. Young, and Fay Singleton, members of the then Board of Supervisors, and to help carry out the plans the Tulare County Good Roads Association was formed which took active charge of the campaign through a committee of twenty-one representative citizens headed by A. W. Quinn of Exeter, president, and Richard E. Stark of Visalia, secretary.

The highway plan adopted called for two hundred twenty miles of concrete highways fifteen and sixteen feet wide and five inches thick, to be surfaced with a carpet of asphalt type two inches in thickness; and as soon almost as the citizens of Tulare County voted in favor of the bonds, road building began, the result being that in December, 1918, less than twenty months after the bond issue was voted, one hundred ninety-seven and one-half miles of concrete roads had been

One of Tulare County's paved highways in the orange growing section of the county.

Where the good roads of Tulare join the good roads of Kings. Tulare County's citizens are proud of their highways.

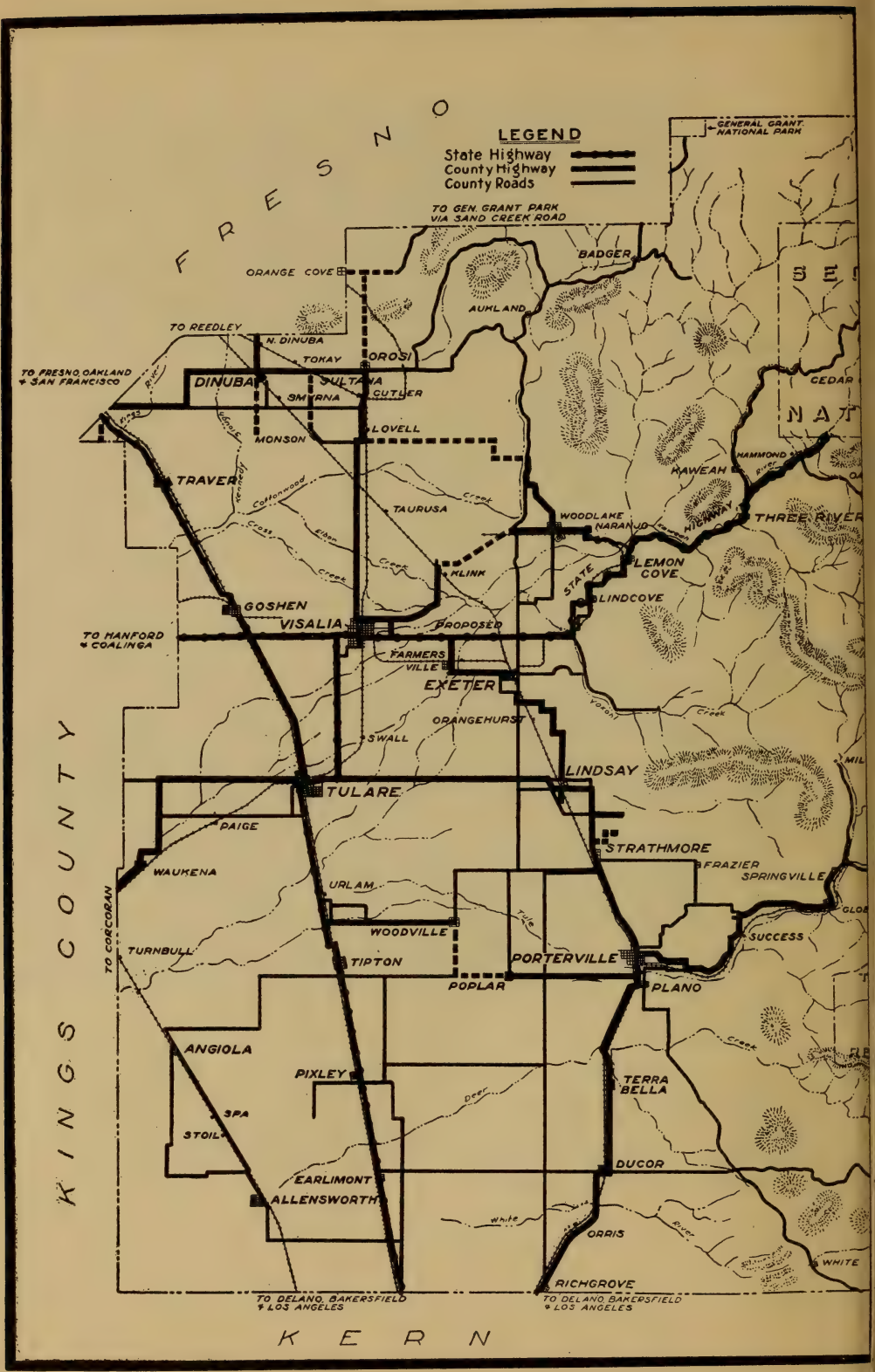
built and opened to traffic, a road-building record which, in view of the fact that it was accomplished in a troublous war period, will stand for some time.

In charge of road construction was the County Board of Supervisors and Byron O. Lovelace, county surveyor and road engineer, and the system they together developed has established a satisfactory reputation for Tulare County in respect to its highways, the surfacing, two inches in thickness, being what is known as Warrenite, superior to most carpet treatments in that it is non-skid in any kind of weather and safe to travel over in addition to contributing to easy riding. Seventy miles of the main boulevard north and south through the county has been, so far, thus surfaced.

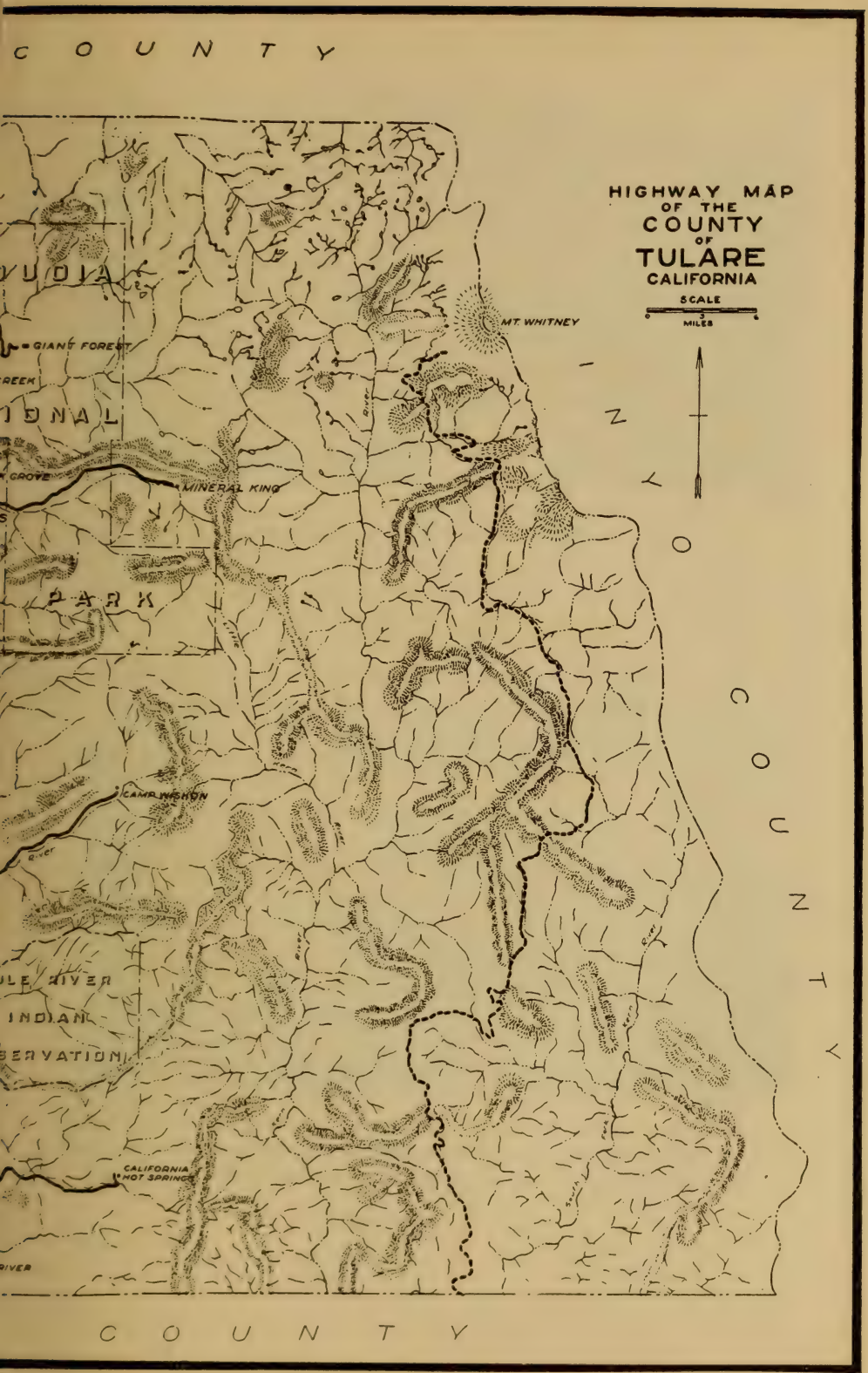
On January 1, 1919, Mr. Singleton was succeeded to the Board of Supervisors by J. K. Macomber and County Surveyor Lovelace by Laurence Moye. Owing to war time construction cost the bond issue proved inadequate to complete the system so the supervisors, after consulting the people of the county, levied a special road tax of $1.50 on the $100 of assessed valuation, which sum will provide for the completion of the system originally planned.

In so far as the commercial need for a modern road system in Tulare County is concerned it may be said that in the citrus section of the county, along the foothills which slope down from the Sierras and take in, from south to north, Richgrove, Terra Bella, Ducor, Plano, Porterville, Springville, Strathmore, Lindsay, Exeter, Merryman, Lemon Cove, Three Rivers, Naranjo, Woodlake, Klink, Orosi, Sultana, Dinuba and Orange Grove, over ten thousand cars of oranges are grown, hauled over county highways, and shipped each year from one to two months earlier than the oranges in the well-advertised Southern California orange-shipping districts.

In addition to the citrus-fruit production peaches, prunes, pears, apricots, apples, olives, figs, plums, almonds, walnuts, table grapes and pomegranates are grown, while wheat and barley are produced in quantity as well as alfalfa, which with different forage crops, supply no inconsiderable burden for Tulare County's highways.



Tulare County has the greatest mileage of concrete highways of any county in California. They are still being extended.



This section of the Tulare County map serves to show the mountainous character of the County. Mount Whitney is the highest peak in the United States proper.

Connecting Dinuba on the north with Richgrove on the south, the highways put in penetrate that section of the county where the mass of citrus production takes place and where much heavy hauling from ranch to railroad exists. One stretch of Tulare County paved road lies west of the State Highway, that reaching from Tulare to Waukena near Tulare Lake on the Kings County line, supplying a connection with the latter county's paved-road system. The state and county north and south main lines are united, east and west across the county, at four points: Kingsburg to Dinuba; Visalia to Three Rivers; Tulare to Lindsay; Pixley to Porterville via Poplar and Woodville; and join with the Kern County system from Delano to Richgrove.

That Tulare County is proud of its road system is evidenced by the fact that at every entrance to the county, huge signboards are placed emphasizing the fact that Tulare is a county of good roads, this advertising being done by the Tulare Board of Trade, the officers of which are J. Sub Johnson, president; T. W. Velie, vice-president, and A. E. Miot, secretary and manager; and to further emphasize the fact the people of the county united in getting the appointment of a citizen of their county as a member of the California Highway Commission, in charge of the state road system.

With an agricultural production of such character as to justify them in bonding their county for more than $2,000,000 worth of good roads, commercial need being in the last analysis the main justification for road-bonding enterprises, the people of Tulare County did not for one moment overlook the possibility of securing a share of that touring traffic which has grown and is growing so remarkably in volume each year in California.

With one of the state's greatest wonders in their county, almost at the outskirts of the thriving towns along the lower slopes of the foothills, the Board of Supervisors built a paved highway almost up to the border of Sequoia National Park, in the main through the canyon of the Kaweah River, the plan adopted by the proponents of the 1919 State Highway

Paved road up the canyon of the Kaweah River, built by Tulare County and taken over by state.

The 1919 State Highway bond issue provides for a connection between Tulare County's roads and Sequoia National Park, entrance to which is shown.

Old road and new highway. A good illustration of what Tulare County has done.

bond issue being to take over the county highway and complete it to the park.

Sequoia Park, it may be said, is a National Park which comprises within its boundaries an area of two hundred fifty-two square miles, in which are twelve groves of Big Trees, Sequoia gigantea, the true "big tree" of California, there being more than twelve thousand of these trees in the park exceeding ten feet in diameter, the General Sherman tree, the largest in the world, being thirty-six and one-half feet in diameter.

Six miles to the north and west of this park is General Grant Park, which, while containing only four square miles holds the General Grant Tree, thirty-five feet in diameter and second only to the General Sherman Tree in size. This park, to be connected with the road system of Fresno County by the state, is also reached by the Tulare County system, this road not being as yet paved. But with the extension of the county highway system it will no doubt be made tributary to the present developed system, while the Director of National Parks has made the construction of a highway between Grant and Sequoia parks one of his two chief recommendations in his 1919 report.

With Mount Whitney, 14,502 feet in height, the loftiest peak in the United States proper, on the border line between Tulare and Inyo counties, it may be grasped that in Tulare County are some of the higher reaches of the Sierras; and in them are a thousand different places attractive to the lover of out-of-doors. To open up this area and to harvest thereby that annual and never-failing crop of dollars left by tourists which has so long been garnered by Southern California is part of Tulare County's future road building plan, and in the meantime the Board of Supervisors has delegated to the Tulare County Board of Trade the duty of advertising the county's highways and resources, supplying funds therefor.

CHAPTER XLV

YOLO COUNTY

For years Yolo County was known as one of California's good-roads counties, the various boards of supervisors building excellent macadam or gravel roads which served slow-moving, horse-drawn traffic comfortably without undue expense of maintenance.

With the development of motor-driven vehicles, however, these roads blew away about as fast as they were built and repaired, and so, in 1917, it became a foregone conclusion that some plan must be adopted for the building of a modern highway system and the Board of Supervisors called upon the United States Bureau of Public Roads for help.

In response to this call a government road-building engineer was detailed to co-operate with the Yolo County board in its plan for highway betterment, and this individual needed but a glimpse at the crop production of the county to convince him that a modern highway system was needed. This report, which is interesting, says: "Yolo County is an important agricultural and orchard section of California and has, in part at least, attained a high state of development. The county has an area of about 640,000 acres, of which 595,317 acres are assessed for taxation, the unassessed area being government land and land not considered of sufficient value for assessment. Under cultivation and bearing crops, according to a survey of the farm adviser and horticultural commissioner, are about 300,000 acres each year, to which should be added another 100,000 acres alternately left fallow and employed in raising grain, making a total of 400,000 acres under cultivation.

"The remaining 200,000 acres are mountain land and over-

The State Highway Yolo-Sacramento Causeway. Yolo County assumed responsibility for the interest charges on this expensive piece of construction work, afterward being relieved therefrom by special act of the legislature.

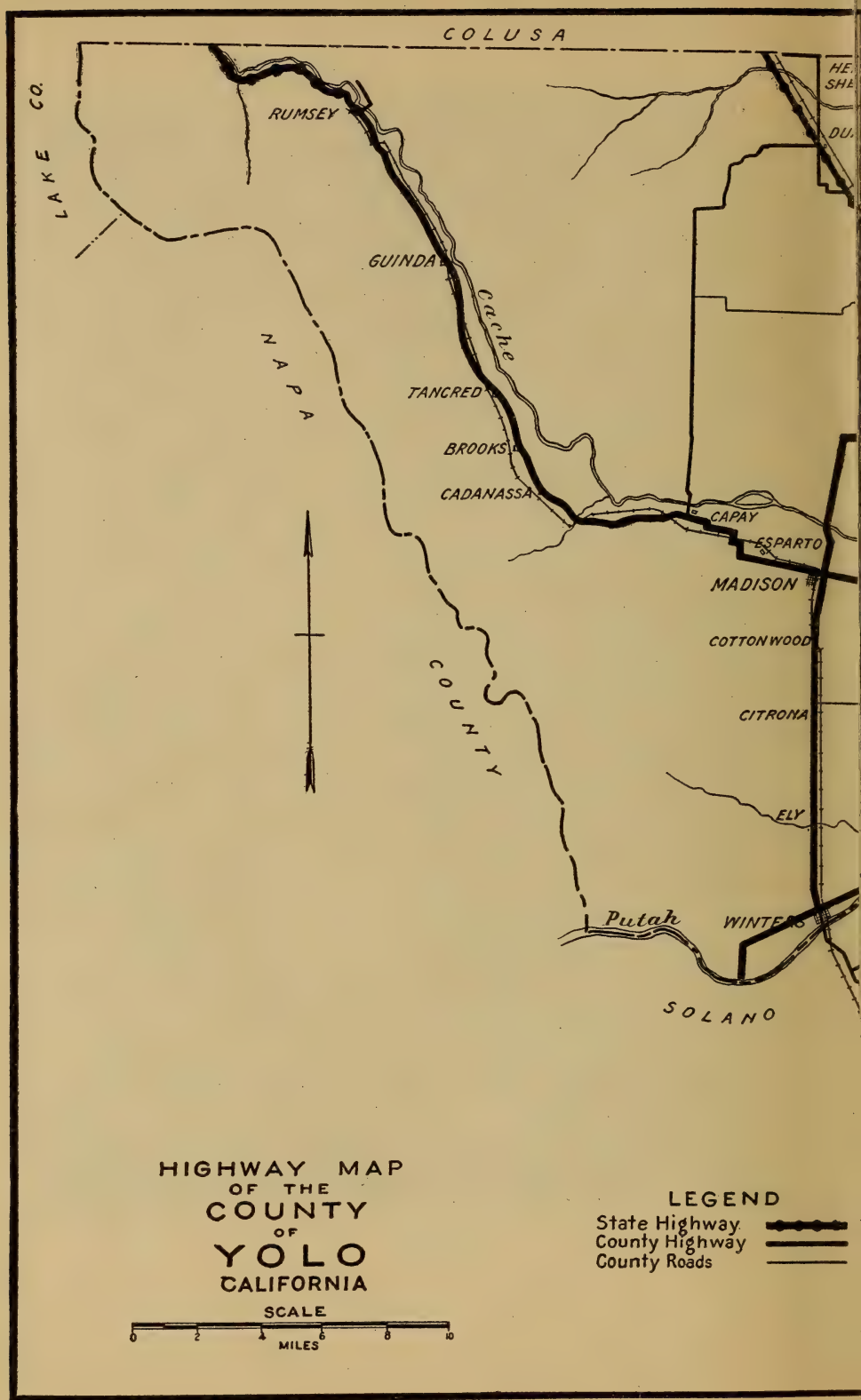
The Capay Valley with highway shown in foreground.

flow land largely employed for the pasturage of stock. A great deal of the overflow land is gradually being brought under cultivation by the building of levees under the reclamation district plan and when so cultivated yields prolific crops. In the year 1917, the last time a complete agricultural census was taken, the distribution of the cultivated area was as follows: 131,885 acres barley, 19,696 acres wheat, 2,744 acres other grains, 38,105 acres alfalfa, 34,557 acres beans, 21,593 acres rice, 3586 acres vegetables, 2373 acres miscellaneous crops (hops, tobacco, cotton, etc.), and 20,255 acres in orchards, the crop value being given as $30,000,000."

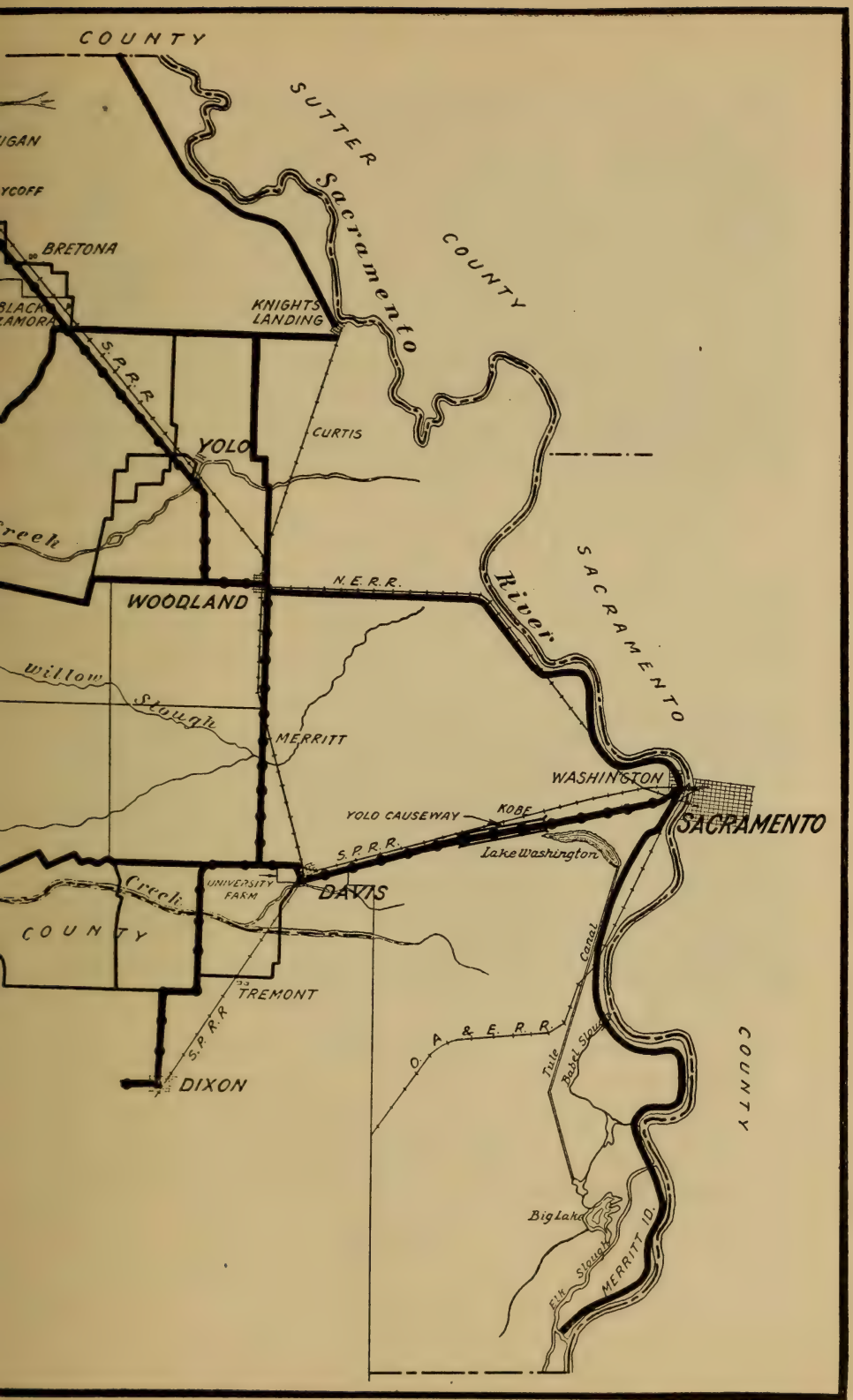
With a production such as described it is not necessary to emphasize the fact that a crying need for modern highways existed in Yolo County, the State Highway which traverses the county in a generally northwardly and southwardly direction supplying a comparison which, to use a good old non-copyrighted phrase, was odious.

The road system adopted for improvement is shown upon the accompanying map, and it may be seen that every town in the county is connected with every other town, all being tied up to the State Highway and thus connected with the vast and ever-growing system of state and county roads, one link in the county system extending from Woodland through Madison and Esparto to Rumsey supplying a connection with a highway provided for by the 1919 State Highway bond issue and reaching from Rumsey to Lower Lake, in Lake County, traversing the canyon of Cache Creek, and forming a connection at Lower Lake with another 1919 State Highway road which connects Lower Lake with the Napa County highway system. This road is important in that it traverses the Capay Valley, where many well-developed orchards produce a big road tonnage, as well as supplies access to the many resorts of Lake County which have for years been served by roads that were little short of impassable because of ruts and dust.

Forming a direct connection between the Valley and the Coast trunk lines of the State Highway by way of a county road between Lower Lake and Lakeport, in Lake County,



Yolo County will have a big mileage of paved road completed in 1920.



The highway east from Woodland when constructed will be an entirely new road.

and reaching into that region which writers of "boost" literature joy in describing as the "Switzerland of America," as if California wasn't good enough, the Woodland-Rumsey stretch of the Yolo County road system is destined to bear a heavy volume of through traffic, serving the commercial needs of the county as well as supplying an attractive touring trip, the scenery in Capay Valley and up Cache Creek being thoroughly worth while.

Equally important as supplying a much-needed addition to the state's system of roads while at the same time traversing a highly developed agricultural area is the Woodland-Knights Landing link of the Yolo County system. This road, with the development of a road across Sutter County already being planned by the Sutter County Board of Supervisors in conjunction with the men engaged in the Sutter Basin reclamation project, commonly known as the Armour project, will supply a short-cut connection between points on the east side of the Sacramento Valley in its upper reaches, tapping the east side State Highway at Yuba City, just across the Feather River from Marysville, and connecting with the west side State Highway at Woodland, cutting out miles of distance and depriving Marysville and Sacramento of no little through travel.

From Winters to Blacks also is a stretch of the proposed county system which will serve as a short-cut connection between State Highway points upon the construction of a road between Winters and Vacaville which the Solano County Board of Supervisors now has under plan. This road will shorten the distance between upper and lower valley points on the State Highway materially and also, it is to be presumed to the grief of Woodland, divert quite a bit of through traffic from that enterprising town.

From Elkhorn through Riverbank, Washington, West Sacramento to Clarksburg is one of the important stretches of county highway, following the bank of the Sacramento River in the main, supplying districts that now have no roads worthy the name with real highways, and traversing the town of Washington, which as the result of a natural overflow

Type of concrete trestle built by Yolo County Board of Supervisors and County Engineer.

This structure and the one shown above were built by county forces and cost much less than the lowest contractor's bid.

A glimpse of existent road traffic in Yolo County and an illustration of the heavy burdens the county's highway must bear.

from Sacramento is already assuming commercial and manufacturing importance and is undeniably destined for much greater development.

In the development of Yolo County's road plans, which culminated on August 26, 1919, by a bond issue for $1,000,000, the Yolo County Board of Supervisors took an active and leading part, this board being made up of M. H. Stitt, chairman; W. J. Leinberger, W. O. Russell, F. B. Edson, and J. S. Scott. In active charge of the campaign was the Yolo Board of Trade, an organization supported and fostered by the Board of Supervisors for county development purposes which, in 1919, was made up of H. H. Gable, R. L. Neman, W. W. Hopper, W. H. Gregory, and Harold Van Tassel, the last named being president, while the man actually responsible was the secretary, Fred Shaffer.

Following the passing of the bond issue the Board of Supervisors, under what is known as the Ream bill, appointed the county surveyor, A. G. Procter, as county engineer and placed in his hands all county road work, that originating under annual county funds as well as the bond issue system, this county following the lead of Sonoma County in taking advantage of the Ream bill and being fortunate in having a man already in office who had, as commented upon by the engineer of the Bureau of Public Roads, proven the efficiency of county methods by building for $25,000 a concrete girder bridge two hundred fifty-four feet long over Cache Creek, upon which the lowest contractor's bid figured $45,000.

The road system planned for Yolo County and to be built by the Board of Supervisors and their county engineer is to be seventy-five miles in length, of concrete, sixteen feet in width, five inches in thickenss, and reinforced where needed, the general plan being to supplement the bond funds with money raised by direct tax or out of the annual road moneys relieved from use by the passing of the bonds; and the present plan, regarded merely as a foundation for future road development, once more places Yolo County in alignment with the good-roads counties of the state and well up among the leaders at that.

CHAPTER XLVI

CONCLUSION

ASIDE from the counties described in the foregoing chapters Ventura County has put in a comprehensive highway system, one of the best in the State, while Imperial County and San Diego County have voted bonds, the necessity of going to press early in December of 1919 prohibiting consideration of their plans.

In addition to these counties San Luis Obispo County and Butte County have bonding plans well under way which will be voted upon before this volume is off the press. Colusa and Marin also are planning bond issues for the early part of 1920.

These county developments as well as State Highway extensions will be treated upon in subsequent editions, the general publication plan involving a revision of this volume at least once each year.

This book has been a difficult undertaking. The material therefor—gathered from many and oftentimes obscure sources—has required much time in compilation. It is admittedly far from perfect even in spite of careful and painstaking work. Yet it supplies in one volume information as to the extent and scope of California's highways, tells how the good-roads movement started and pictures the progress of a quarter of a century that had birth when a few old time enthusiasts with sage-like gravity discussed the possibilities of the bicycle (the old time highwheeled bicycle at that!) which enabled a man to travel "in comfort," 40 miles a day. From that day to the present, when legislation is required to keep the jitney aeroplane from alighting upon public highways, is a far, far step.

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Z

Zaca Canyon Route, 84.

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